

Marshall Space Flight Center Office of the Chief Information Officer

### FIVE-YEAR INTEGRATED INFORMATION TECHNOLOGY PLAN



#### **NASA Core Values**

NASA is privileged to take on missions of extraordinary risk, complexity, and national priority. NASA employees recognize their responsibilities and are accountable for the important work entrusted to them. If good strategic planning provides the long-term direction of our Agency, our shared core values express the ethics that guide our behavior. We value:

- ▶ **Safety**—NASA's constant attention to safety is the enormous cornerstone upon which we build Mission Success. We are committed, individually and as a team, to protecting the safety and health of the public, our team members, and those assets that the Nation entrusts to us.
- ▶ **Teamwork**—NASA's most powerful tool for achieving Mission Success is a multi-disciplinary team of competent people. The Agency will build high-performing teams that are committed to continuous learning, trust, and openness to innovation and new ideas.
- ▶ Integrity—NASA is committed to an environment of trust, built upon honesty, ethical behavior, respect, and candor. Building trust through ethical conduct as individuals and as an organization is a necessary component of Mission Success.
- Mission Success—NASA's reason for being is to conduct successful space missions on behalf of this Nation. We undertake missions to explore, discover, and learn. And we believe that mission success is the natural consequence of an uncompromising commitment to safety, teamwork, and integrity.

## A message from the

## MSFC Chief Information Officer

As the Agency and the Center take bold steps forward to meet the challenges set forth in the Vision for Space Exploration, our organization is pleased to provide critical Information Technology (IT) services and support to NASA. Our success is defined by our ability to enable Marshall Space Flight Center's (MSFC's) success through IT leadership. This document, our *MSFC CIO Five-Year Integrated Information Technology Plan (IITP)*, details our support of the Agency and Center through strategically-aligned key initiatives over the next five years.



Our organization is committed to delivering superior services to our customers. To meet this goal we have developed an integrated, orderly, and disciplined approach to proactively deal with the opportunities and challenges in our environment.

The Integrated Information Technology Plan Framework (IITPF), introduced last year in our *MSFC CIO IT Master Plan 2005*, allows us to manage our organization in this way. This approach ensures that our organization will continue to deliver exceptional services in a time of significant Agency and Center transformation.

Our organization will continue to rise to the challenge of providing the highest levels of service and customer satisfaction. With your help, we will achieve our vision, and enable the NASA family to continue the greatness of the U.S. Space Program.

#### Jim Ellis

MSFC Office of the Chief Information Officer

# **Table of Contents**

NAS	SA Vi	sion	V
Exe	cutive	Summary	vii
1	Sun	porting the Agency Mission	1
1	1.1	Understanding Our Environment	
	1.2	Objectives That Enable the Mission	
	1.3	Pursuing Our Objectives	
2	Inte	grated IT Planning Framework	
2	2.1	Voice of the Customer (VOC)	
	2.1	2.1.1 Customer Segmentation	
		2.1.2 Customer Touch Points—The Customer Experience Catalog	
		2.1.3 Customer Feedback	
	2.2	IT Governance	
	2.3	IT Capital Planning and Investment Control (CPIC)	
	2.4	Enterprise Architecture (EA)	
		2.4.1 MSFC EA Reference Models	
		► MSFC Business Reference Model (BRM)	
		► MSFC Service Reference Model (SRM)	
		► MSFC Technical Reference Model (TRM)	
		2.4.2 EA Inputs	22
		2.4.3 EA Outputs	23
		▶ What-If Analysis	23
		► Gap Analysis	23
		► MSFC CIO Services To-Be State	24
	2.5	Information Technology Evaluation Program (ITEP)	
		2.5.1 Technology Evaluation (TE) Process	
		► Identify Technology	
		► Characterize Technology	
		▶ Validate Compatibility	
		2.5.2 Information Technology Focus Groups (ITFGs)	
		2.5.3 Information Technology Evaluation Database (ITEDB)	
		2.5.4 Information Technology Council (ITC)	29
3	Time	eframe of the Integrated IT Planning Framework	31
	3.1	Develop Initial Capabilities	
	3.2	Utilize and Refine Full Capabilities	
	3.3	Manage IT Based on Strategic Customer Insights	
4	MCT		
4		CC CIO Initiatives Aligned With Objectives	
	4.1	MSFC CIO Organization Objective One: Provide a Robust and Interoperable IT Infrastructure	
		4.1.1 Highlights of Initiatives and Trends	
		<ul> <li>Networking</li> <li>Mobile Computing and Technology</li> </ul>	
		<ul> <li>Mobile Computing and Technology</li> <li>Disaster Recovery and Continuity of Operations</li> </ul>	
		Disaster Recovery and Continuity of Operations     Document Management	
		- Document ividitagement	43

	4.1.2	Planned MSFC CIO Initiatives	
		► Develop/Modernize/Enhance (DME)	43
		► Steady State (SS)	43
4.2	MSFC	CCIO Organization Objective Two: Ensure IT Resources and Infrastructure Are Secure and Accessible	e44
	4.2.1	Highlights of Initiatives and Trends	44
		Tools and Applications	44
		Managment Processes	
		► Trends	
	4.2.2	Planned MSFC CIO Initiatives	
		► Develop/Modernize/Enhance (DME)	
		► Steady State (SS)	
4.3	MSFC	CCIO Organization Objective Three: Deliver Innovative, Quality Products and Services	
	4.3.1	Highlights of Initiatives and Trends	
		Customer Support	
		► Critical Systems and Applications Support	51
	4.3.2	Planned MSFC CIO Initiatives	
		► Develop/Modernize/Enhance (DME)	55
		► Steady State (SS)	
4.4	MSFC	CCIO Organization Objective Four: Be the Leader in Delivering Agency IT Services	
	4.4.1	Highlights of Initiatives and Trends	
		▶ Networking	
		► NASA Collaborative Infrastructure Conference Rooms	
		► Tools and Applications	
		▶ Business Systems and Institutional Support	
	4.4.2	Planned MSFC CIO Initiatives	
		► Develop/Modernize/Enhance (DME)	62
		► Steady State (SS)	
4.5	MSFC	CCIO Organization Objective Five: Balance and Optimize IT Investments, Development,	
		andardization. (Review IT Architecture to ensure it does not become obsolete.)	64
	4.5.1	Highlights of Initiatives and Trends	64
	4.5.2	Planned MSFC CIO Initiatives	65
		► Develop/Modernize/Enhance (DME)	65
		► Steady State (SS)	65
4.6	MSFC	CCIO Organization Objective Six: Lead the Technical and Business Management	
	of IT	Resources at MSFC	66
	4.6.1	Highlights of Initiatives and Trends	66
		► Software Process Improvement Initiative	67
		▶ Process and Capabilities Streamlining	67
	4.6.2	Planned MSFC CIO Initiatives	67
		► Develop/Modernize/Enhance (DME)	67
		► Steady State (SS)	68
Clas	ina		60
Cios	nng	► Enabling the Mission	
		► A Customer-Focused Strategy	
		Now and Beyond	
		·	
App	endices		
		► Appendix A—References and Source Documents	
		► Appendix B—Acronym List	
		► Appendix C—MSFC CIO Organization Chart and Points of Contact	
		► Appendix D—MSFC CIO Steady State Initiatives	75

#### **NASA Vision**

#### Moon, Mars, and beyond...

The fundamental goal of this vision is to advance U.S. scientific, security, and economic interests through a robust space exploration program. In support of this goal, the United States will:

- Implement a sustained and affordable human and robotic program to explore the solar system and beyond;
- Extend human presence across the solar system, starting with a human return to the Moon by the year 2020, in preparation for human exploration of Mars and other destinations;
- Develop the innovative technologies, knowledge, and infrastructures both to explore and to support decisions about the destinations for human exploration; and
- Promote international and commercial participation in exploration to further U.S. scientific, security, and economic interests.

#### **MSFC Goals**

- ► MSFC Goal One—Superior execution of assigned programs and projects
- ► MSFC Goal Two—Secure key roles in space exploration development
- ► MSFC Goal Three—Organizational management excellence.



# **Executive Summary**

The Marshall Space Flight Center (MSFC) Chief Information Officer (CIO) Integrated IT Plan (IITP) shows how the MSFC CIO intends to strategically align IT efforts in support of the Center and Agency over the next five years. This document describes a Center-wide IT strategy, planning framework, and initiatives that will enhance our capabilities around integrated IT planning and providing effective support to our customers.

Section 1 details key influences that impact the way in which the MSFC CIO supports the Agency's Mission. Objectives that guide the work of the MSFC CIO are also discussed, including a structure that allows the MSFC CIO to pursue specific, measurable actions to ensure results in supporting the Center and Agency.

Section 2 details the MSFC CIO Integrated IT Planning Framework (IITPF) and how its five components work together to provide a structure for incorporating strategic drivers and analytical rigor into MSFC CIO IT planning and IT investment decisions.

Section 3 documents the timeframe of the Integrated IT Planning Framework in a phased approach.

Section 4 details specific implementation actions, intended outcomes, and examples of initiatives aligned with each MSFC CIO objective. Insights and trends for the next five years and beyond are also discussed, including emerging areas and technologies of IT and how these can be used to address future customer requirements.

Initiatives shown for FY 2006 are planned for implementation in year one of this five-year plan.

#### **MSFC CIO Organization Objectives**

One: Provide a Robust and Interoperable IT

Infrastructure

Two: Ensure IT Resources and Infrastructure Are Secure

and Accessible

Three: Deliver Innovative, Quality

**Products and Services** 

**Four:** Be the Leader in Delivering

Agency IT Services

Five: Balance and Optimize IT

Investments, Development, and Standardization. (Review IT Architecture to Ensure it does not become obsolete.)

**Six**: Lead the Technical and

Business Management of IT Resources at MSFC.



Who are we?

What is our role?

What are our goals?

What are we going to do?

What is our strategic approach?

# Supporting the Agency Mission

MSFC plays a critical role in supporting and executing NASA's mission. The MSFC Office of the CIO supports this critical role through the products and services it provides. The MSFC CIO is responsible for the execution and delivery of IT services and support to both MSFC and Agency customers. The strategic use of IT is an essential element in helping customers achieve the Center and Agency strategic and operational goals. The objective of the MSFC CIO Five-Year IITP is to ensure the alignment of our resources to support MSFC's implementation of the Agency's strategy over the next five years.

#### 1.1 Understanding Our Environment

While our direction is set by NASA, federal legislation, policies, and guidelines significantly impact the way our organization operates. The MSFC CIO frames internal capabilities in terms of the demands of our environment through an understanding of the Agency's Vision, MSFC's role in this Vision, and the potential impact of other external influences. Through this understanding of our environment, we can successfully manage and implement IT initiatives that support the work of the Center and Agency. Table 1.1-1 shows key NASA and federal drivers of the MSFC CIO environment which provide essential information necessary to develop the *MSFC CIO Five-Year IITP*.

Table 1.1-1—Key NASA and federal drivers of MSFC CIO environment.

Environmental Factor	Overview	Influence on IT Management at MSFC
► Vision for Space Exploration	Presidential direction which sets the Agency's priorities and forms the basis of NASA's Mission	► Aligns MSFC IT to support Agency's Mission
► NASA Strategic Plan	► Sets the course for the Agency, establishes high-level metrics against which to measure performance, and communicates those expectations to NASA stakeholders	<ul> <li>Provides a frame of reference for Center goals in meeting Agency requirements</li> <li>Aligns MSFC IT to support Agency's strategic goals</li> </ul>
<ul><li>NASA Strategic Management and Governance Handbook</li></ul>	Sets forth the principles by which NASA strategically manages the Agency	► Guides MSFC CIO's Implementation management
► MSFC Implementation Plan	Defines the actions the Center will take to accomplish the Agency's strategic goals	Aligns MSFC IT capabilities to support the Center's implementation actions
► President's Management Agenda	Requires that federal organizations employ strategic management of human capital, improve financial performance, initiate expanded electronic government, and implement budget/performance integration	► Ensures MSFC IT support of electronic government and evolving business process needs
► Information Technology Man- agement Reform Act (ITMRA) 1996 (Clinger-Cohen Act)	<ul> <li>Requires all Federal organizations to employ formal management processes in the selection, control, and evaluation of IT capital investments</li> </ul>	► Ensures MSFC IT Capital Planning and Investment Process is employed
<ul> <li>Other legislation, policy, and guidelines (e.g., Section 508, FISMA, etc.)</li> </ul>	<ul> <li>Defines other governing rules for Information Technology</li> </ul>	► Influences various directives, guidelines and procedures

#### **MSFC Goal One**

Superior execution of assigned programs and projects

#### **MSFC Goal Two**

 Secure key roles in space exploration development

#### **MSFC Goal Three**

 Organizational management excellence The success of the MSFC Office of the CIO will be determined by our ability to effectively support the goals of the Center and Agency. MSFC established three goals that enable the Center to support Agency goals, and they are the key directions and undertakings that will shape the future of the MSFC CIO.

MSFC plays an important role in executing NASA's future work, and the MSFC CIO enables the success of the Center and Agency by strategically aligning its efforts with Center and Agency goals. This alignment is shown in figures 1.1-1 and 1.1-2 and further is detailed in Section 4.

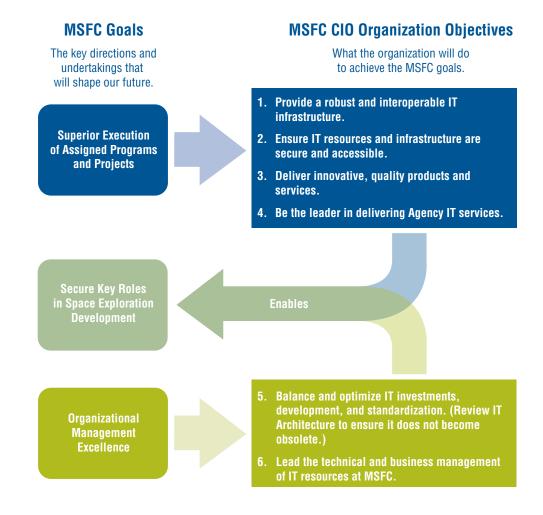


Figure 1.1-1—MSFC CIO organization objectives enabling MSFC Goals.

							g the Agency Mission
			MSFC	Goal #1			Goal #3
					Organizational Man	al Management Excellence	
		MSFC CIO Objective #1	MSFC CIO Objective #2	MSFC CIO Objective #3	MSFC CIO Objective #4	MSFC CIO Objective #5	MSFC CIO Objective #6
★ Direct alignment with Initiative/Strategy/Goal		Provide a robust and interoperable IT	Ensure IT resources and infrastructures	Deliver innovative, quality products	Be the leader in delivering Agency IT	Balance and optomize IT investments, develop-ment, and standardiza-	Lead the technical and business management of IT resources at MSFC
<ul> <li>Enables Initiative/Strategy Goal</li> </ul>	/	infrastructure	are secure and accessible	and services	services	tion. (Review IT Architecture to ensure it does not become obsolete.)	ii resources at more
Presidents Management Age	nda Ini	tiative					
Expanded Electronic Government		*	*	*	*	*	*
NASA's Five Implementing St	rategie	S					
Achieve management and institutional excellence comparable to NASA's technical excellence	IS-1	*	*	*	*	*	*
Demonstrate NASA leader- ship in the use of IT	IS-2	*	*	*	*	*	*
Enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost	IS-3	<b>*</b>	<b>*</b>	<b>*</b>		<b>*</b>	
Ensure that all NASA work environments on Earth and in space are safe, healthy, environmentally sound, and secure	IS-4		<b>*</b>				
Manage risk and cost to ensure success and provide the greatest value to the American public	IS-5	*	*	*	*	*	*
NASA CIO Information Resou	rces Ma	anagement (IRM) S	Strategic Goals				
Provide an infrastructure that can evolve and adapt to emerging technologies and service models	Goal #1	*	*		*		*
Optimize investments in mission and program unique IT systems by utilizing common infrastructure tools and services where practical	Goal #2	*		*	*	*	*
Provide a customer focus to the provisioning of common IT services across NASA	Goal #3			*	*	*	*
Protect and secure the Agency's information assets	Goal #4		*		*	*	*
Maintain an Agencywide IT investment portfolio in alignment with mission and business needs	Goal #5	<b>*</b>		•	*	*	*
Ensure the viability of the Agency's IT workforce	Goal #6				<b>♦</b>		<b>♦</b>

Figure 1.1-2—MSFC CIO Objectives Supporting the Agency Mission.



#### ■ 1.2 Objectives That Enable the Mission

With an understanding of our environment, the MSFC CIO established six Organization Objectives to direct our work. These objectives, shown in figure 1.1-1, were created to ensure our work is consistent with the Agency's Mission and MSFC Goals.

The six MSFC CIO Organization Objectives directly support the first and third MSFC Goals, while enabling the successful execution of the second MSFC Goal to Secure Key Roles in Space Exploration Development. The MSFC CIO Organization Objectives define what our organization will do and help manage our organizational capabilities to meet the dynamic needs of the Center and Agency, aligning with mission needs and ensuring adherence to Federal and Agency level direction.

The MSFC CIO is committed to supporting the Center and Agency by providing IT services that are critical to implementing NASA's Mission. We provide IT infrastructure and services that enable and support the successful execution of many Center and Agency programs and projects including:

- Space Shuttle and *International Space Station (ISS*), directed by the Space Operations Mission Directorate (SOMD).
- Crew Launch Vehicle (CLV) and Robotic Lunar Exploration Program (RLEP) lunar lander, directed by the Exploration Systems Mission Directorate (ESMD).
- Programs and projects directed by the Science Mission Directorate (SMD).

Figure 1.1-2 shows the alignment of the six MSFC-managed IT objectives with Center and Agency goals and a broader initiative from the President's Management Agenda. This figure also illustrates the high level of interdependency and engagement of our capabilities and services in the realization of NASA Mission success and furthered support of Federal management initiatives.

#### **MSFC CIO Vision:**

People, technology, and information working together for NASA.

#### **MSFC CIO Mission:**

Enabling MSFC's success through information technology leadership.

#### ■ 1.3 Pursuing Our Objectives

NASA's three stages of strategic management<sup>1</sup> (fig. 1.3) set the framework to ensure that actions taken to support the Agency's strategic goals are providing the desired results. Similarly, the MSFC CIO will manage its work by pursuing specific, measurable Implementation Actions to ensure results in meeting its Organization Objectives supporting the Center and Agency.

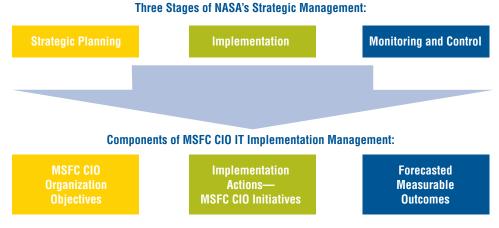


Figure 1.3-1—Supporting NASA's Strategic Initiatives.

The **MSFC CIO Organization Objectives** guide what our organization does and why we do it, with a focus on the future. They define the strategic intent of our organization and provide a clear understanding of our purpose.

The **MSFC CIO Implementation Actions** are the principles and ways of working that will guide our organizational efforts. They provide focus for our activities. **MSFC CIO Initiatives** are the foundation of and means to execute our Implementation Actions.

The results of our Implementation Actions will be measurable, based on **Forecasted Measurable Outcomes** (FMO) and quantifiable metrics. FMOs are a short list of metrics that have been identified for each objective as the most important variables reflecting organizational performance. FMO's will allow us to evaluate the level of success in executing our implementation actions, initiatives, and in achieving our Organization Objectives.



How will we manage MSFC Information Technology?

# Integrated IT Planning Framework

To meet the dynamic needs of the Center and Agency, in FY 2005 the MSFC Chief Information Officer (CIO) implemented a strategic, disciplined approach to managing the diverse aspects of the Center's Information Technology (IT) resources through an Integrated IT Planning Framework (IITPF). This framework enabled the alignment of Center IT resources in support of Agency and Center goals, helping to ensure good stewardship of resources. This framework also allows us to actively monitor changes in our environment, ensuring that Center IT investments meet current and emerging needs.

This strategic perspective for our organization is created by the five key components of the Integrated IT Planning Framework:

- ▶ **Voice of the Customer** (VOC) ensures that the MSFC CIO understands the needs of customers.
- ▶ **IT Governance** specifies the decision rights and accountability framework to encourage desirable behavior in the use of IT.
- ▶ IT Capital Planning and Investment Control (CPIC) helps ensure that the Center IT investments are strategically leveraged to shape and support NASA's business and mission processes.
- ▶ **Enterprise Architecture** (EA) ensures that our future lines of business and services are strategically aligned with the direction of the Agency.
- ▶ **Information Technology Evaluation Program** (ITEP) ensures that our organization understands emerging information technologies that could impact and improve the services we provide.

#### An Integrated View

The IITPF provides a structure for incorporating strategic drivers and analytical rigor into MSFC CIO IT planning and IT investment decisions. Components of the IITPF work together to influence IT investment decisions (fig. 2-1). VOC, EA, and the ITEP each provide strategic influence to proposed IT investments, ensuring that they are strategically aligned based on the understanding of customers, architectures, and new technologies. VOC, EA, and ITEP consider strategic and business drivers such as:

- ▶ What is our customers' role in executing the Agency mission?
- ▶ What future lines of business will meet the goals of our customers?
- ▶ What services will our customers need?
- ▶ What emerging technologies may allow us to fill the gaps in our services?

The future state of the EA results from analyses that answer these questions. Once the future EA state is officially approved by a Governance structure, it becomes the "To-Be" state in which all proposed IT investments must be compliant.

#### Influence Strategic and Business Drivers Strategically Aligned, Compliant Input **CPIC** Prioritized Input Approved Investments Voice of the Customer (VOC) Planning & **IT Governance Prioritize** (CPIC) & Budget Information Technology **Evaluation** IT Governance **Program** (ITEP) CPIC Proposed **Proposed IT Investment List IT Investment** List (Selected Initiatives) Other Influences (Including externalcommercial, technology, (All Initiatives) sourcing, etc.)

**Integrated IT Planning Framework (IITPF)** 

Figure 2-1—MSFC CIO Integrated IT Planning Framework

The EA To-Be state affects proposed IT investments in two ways: First, it ensures that new investments are strategically aligned and architecturally compliant; and secondly, it drives creation of new investments that close the gaps in the transition to the strategically-aligned future architecture.

IT investments also result from other influences such as sustaining needs, legislation, policies, and external influences including commercial technology changes and commercial sourcing opportunities.

The complete set of proposed IT investments undergo a rigorous prioritization and selection process as part of the CPICprocess. CPIC is a standardized, analytical

process that ranks and weighs proposed IT investments based on predefined, objective criteria. Strategic and business drivers influence the CPIC process through the EA To-Be state, which defines compliance criteria for services and technologies that are strategically aligned with customer needs and the future direction of the Center and Agency.

Table 2-1—Examples of inter-relationships between IITPF components.

Output from:		What?	Input to:	
	provides	Customer needs	to	EA
VOC		Customer needs in emerging technologies     Communities of interest	to	ITEP
		Proposed IT investments	to	CPIC
Covernonce	provides	Decision-making structure to approve To-Be architecture	to	EA
Governance		Decision-making structure to select IT investments	to	CPIC
CPIC	provides	ist of prioritized MSFC IT investments		Governance
	provides	Technology requirements for the To-Be state of the EA Technical Reference Model	to	ITEP
EA		To-Be state compliance criteria     Proposed IT investments to close gaps in transition to To-Be state	to	CPIC
ITEP	provides	Validated technologies which are candidates for the EA To-Be state	to	EA
11.61		Proposed IT investments	to	CPIC

The output from CPIC is a prioritized list of IT investments with a budget line that specifies the demarcation for funded (higher priority) and unfunded (lower priority) IT investments.

IT Governance provides the structure that enables the decision-making of the final, approved set of IT investments. This IT Governance step allows any final considerations to be made that may be necessary prior to final approval.

The resulting set of approved IT investments have been selected strategically through a standardized, disciplined, and analytical process based on alignment with Agency and Center goals, customer needs, and the EA To-Be state.

As shown in figure 2-1 and discussed in the detailed descriptions of each component later in this section, each component piece of the IITPF also influences other component pieces. Examples of some of these interrelationships of IITPF components are shown in table 2-1.

As the outputs from each component of the IITPF become available, they will drive MSFC integrated IT planning and future five-year integrated information technology plan documents. Subsequent annual updates to the *Five-Year Integrated Information Technology Plan (IITP)* will reflect a new five-year projection of Center IT needs.

In summary, the IITPF helps define and adjust IT investments in order to support Agency and Center goals. The overall result is that the MSFC CIO makes better IT investment decisions and reduces the costs of providing IT products and services to our customers.

#### The Value Proposition of the IITPF

As each element of the IITPF interacts to provide information essential for organizational management, significant gains can be realized such as:

- Informed Investment Planning: incorporates additional rigor and analysis for major IT investments and associated funding, allowing better IT investment decisions in support of the Agency mission.
- Improved Organizational Efficiency: ensures a fair, standardized, transparent decision-making process and further helps to rationalize and optimize the decision-making processes and the management of IT.
- Ensured Stewardship of Federal Resources: allows us to better align technology with the goals of the Center and Agency which ultimately makes better use of resources, enabling the Agency's mission to be affordable and subsequently helps the Center achieve superior execution of assigned programs.
- Ensured Relevancy of Our Work: helps to ensure that we are doing the right things the right way in serving our customers and managing IT to meet current and emerging needs
- Increased Ability to Meet Agency Needs: allows us to ensure that our work is
  consistent with and responsive to the Agency's formalized enterprise architecture
  and IT capital planning and investment control processes.

#### 2.1 Voice of the Customer (VOC)

The objective of the Voice of the Customer (VOC) capability of the *Five-Year IITP* is to develop a customer-centric strategy for the MSFC CIO to service both Center and Agency customers' IT needs. A customer-centric strategy is based on an understanding of what our customers need and how they interact with us. A customer-centric strategy is underscored by the following baseline principles:

- ▶ Understanding processes from a customer point of view.
- ▶ Ensuring that customer needs drive our processes.
- Communicating in the language our customer can understand.
- Integrating customer needs into our processes.
- Objectively measuring and reporting performance against customer needs.

In order to develop an actionable plan to improve customer service, the MSFC CIO must have an understanding of the current baseline regarding customer wants, needs and expectations. The VOC capability is designed to provide that baseline so that an actionable and comprehensive customer service strategy can be developed and executed across all operational areas and all customers. This capability is focused on accomplishing three tasks:

- 1. Segmenting our customers into groups that have like IT needs and developing strategies that address those unique needs.
- 2. Defining the customer touch-points between the MSFC CIO and customers.
- 3. Getting first hand feedback from our customers via one-on-one interviews, surveys and focus groups to develop customer focused services and initiatives that improve overall customer service.

Through this approach, the MSFC CIO will better understand if we need to:

- Invest in technical training to ensure skills provided meet customer needs.
- ► Refine service delivery approach based on desires of different customer segments.
- Change our service offerings to better meet customer demands.
- ► Modify processes to become more efficient and improve customer satisfaction.



ar Integrated Information Technology Plan -

- ▶ Update CIO enabling technology to lower costs and improve service.
- ▶ Provide customer training on service offerings.
- Market our services more effectively.

The VOC assessment is an outgoing activity. The intent is to continually refine our understanding of our customers' needs to generate improvement initiatives that will make our organization more customer-centric and efficient.

In addition, the output from the VOC helps the EA team better understand custom-er-focused business processes and enabling technology by providing inputs to the Business Reference Model (BRM), Service Reference Model (SRM), and Technical Reference Model (TRM). These models are described further in Section 2.4. The outputs from VOC will also provide guidance to the ITEP activities to evaluate new technologies that can be used to improve customer service in the future. And finally, VOC outputs will help define the high-level customer service objectives upon which the *Five-Year IITP* is built. Specific outputs include:

- Establishing an over arching Customer Strategy.
- Conducting customer experience assessments to baseline customer expectations and prioritize customer service requirements.
- Aligning the Service Level Agreement (SLA) framework based on customer service requirements.
- Creating a customer satisfaction survey process based on the customer experience assessment framework.

#### ■ 2.1.1 Customer Segmentation

By segmenting our customers into smaller groups with similar needs the MSFC CIO can develop targeted approaches for service and support based on unique needs and priorities. This will allow us to develop targeted programs that address a specific need rather than a Center or an Agency-wide program that impacts only a subset of all the customers. The intent is to improve our customer service and lower our service delivery costs by becoming more focused on our customer groups and their unique needs. We will improve customer experiences through improved product and service delivery, and over time we will measure changes in customer interactions for each segment to make sure customer experience is improving.

Each customer group has unique attributes that need to be better understood. For example, the Mission Support users are primarily interested in obtaining and using



MSFC CIO customers are segmented into three groups:

- Mission Support—users who provide administrative support to the operations of the Center, like the Office of the Chief Financial Officer (CFO).
- Mission—users whose primary focus is to achieve a specific NASA mission.
- Technical Base—users who provide engineering and technical support to multiple missions and conduct basic research in support of future missions.

commodity IT services. IT projects are primarily focused on business unit needs and their priorities are cost, ease of use, and delivery schedule. On the other hand, the Mission users look for IT services from their mission contractors due to the specialized technology needs of their requirements. These customers expect the CIO to provide project management skills in the areas of requirements development, analysis, and project scheduling. Their projects tend to have more impact across the Center and the Agency, so they require more help from the CIO's office to help manage this complexity. Their priorities are on schedule, quality, and cost.

By understanding, analyzing, and designing new and better customer experiences, customer interactions can be improved, customer satisfaction can be improved, and overall service delivery and support costs can be reduced.

#### ■ 2.1.2 Customer Touch Points—The Customer Experience Catalog

Customer relationships are built from a series of experiences or touch points over time that create customer trust and loyalty. The foundation of this relationship is the experiences our customers have when they interact with us. A customer experience is the customer's view of what happens when they engage with us to meet a specific IT need (i.e., get information, order a product/service, resolve an issue.) The relationship formed with our customers is influenced by positive and negative experiences over time. Therefore a customer relationship is the sum of all experiences customers have with the MSFC CIO organization.

Understanding our customer's experiences, from their perspective, will help us to align ourselves more effectively with what they need. Therefore our goals are to:

- ▶ Identify important experiences customers have when interacting with the MSFC CIO and, consciously or not, decide how they will interact with the organization in the future.
- ▶ Document specific "pain points" that customers have when interacting with the Office of the CIO.
- Understand how those experiences and pain points impact customer interaction and business operations.
- Develop an action plan, or Customer Relationship Management (CRM) road map, for redesigning or improving those important experiences with supporting processes/technologies.

We use a tool called the Customer Experience Catalog (fig. 2.1.2-1) to help us document customer experiences and better understand what our customers need. The experience catalog was developed with six experiences that represent our customer touch points.

#### Plan

Planning what IT products & services are needed.

#### Learn

Understanding what IT products & services are available.

#### Order

Selecting & purchasing an IT product or service.

#### Track/Receive

Following the progress of an order.

#### Use

Delivery and usage of the service.

#### Resolve

Managing issues to resolution.

Figure 2.1.2-1—Customer Experience Catalog.

### The Customer Experience Catalog

#### The Planning Experience

relates to the initiation of an activity, project, or program that has an IT component. Planning includes a number of events that are important to customers as they begin thinking about projects and the purchase of IT services and products:

- Create plans and budgets.
- Define planning policies, procedures, and guidelines.
- Initiate program or project to meet strategic and tactical goals.
- Develop project plans.
- Define and refine requirements.

#### The Learning Experience

has some overlap with the Planning Experience and starts when customers begin selecting an IT product or service to satisfy a business requirement. Learning includes a number of events that are important to customers as they exit the planning process and begin making purchase decisions:

- Collect information on available products/services.
- Talk with vendors/peers to understand product or vendor capabilities.
- Evaluate and compare service providers for a new project or program.
- Perform financial analysis.
- Interpret and comply with policies (e.g., IT Security, 508, etc.).

#### The Ordering Experience

starts when the customer has made a decision to procure a product or service and ends when the order has been confirmed. Ordering includes events associated with obligating funds and completing the purchase or acquisition of IT products and services:

- Select the product or service desired.
- Obtain purchase or funding approval.
- Place the order (via paper form or on-line).
- Receive order confirmation and expected delivery date.

#### The Tracking/Receiving Experience

starts after the order has been placed and ends with the receipt of a product or service. Tracking/receiving includes events associated with monitoring the delivery of IT products and services:

- Check status of an order or project.
- Receive the product or service.
- ☐ Inspect product.
- Route or distribute the product.
- Complete the project.

#### The Using Experience

begins after the receipt of an IT product or service. Using includes events related to the use and consumption of IT products and services:

- Use of a product (e.g., cell phone, desktop, laptop...) or application.
- Consume a service (e.g., project management, programming, etc.).
- Take training to effectively use an IT product or services.
- Pay for product or service.
- Close out a project.

#### The Resolving Experience

begins when a customer notices a problem and communicates the issue to the Office of the CIO. The Resolving experience is a cross-cutting experience—we do this across all of the other experiences. Resolving includes events associated to identifying and fixing the problem:

- Identifying an issue
- Communicate the issue
- Determine root cause
- Achieve resolution.

This customer experience framework is used to track both customer satisfaction and customer interactions over time and will be used to monitor how well our customers are being supported.

#### ■ 2.1.3 Customer Feedback

To understand which experiences are most problematic for our customers, the MSFC CIO conducts various forms of data gathering, and then analyzes the data to identify the most problematic experiences per segment. This assessment provides relevant customer information needed to make business decisions to best support our customers.

We will use the Customer Experience Catalog as the framework for developing interview guides and on-line surveys to gain insight into the primary pain points our customers have when interacting with us and what they do as a result of those experiences.

The customer experience approach positions us to answer three key customer-centric measurement questions:

- ▶ Did we deliver the experience as planned?
- ▶ Did the customer perceive an improved experience to the degree we expected?
- ▶ Did the customer interaction positively change as expected?

Once the top experiences have been identified, the MSFC CIO will collaborate to analyze those specific pain points, determine the root cause, quantify the economic and customer impact, and then recommend solutions. To gain additional insight, we will also conduct ad-hoc focus groups to validate findings and get first-hand feedback on proposed customer focused initiatives.

In addition, the MSFC CIO will develop customer satisfaction surveys that will probe into a specific experience or target a select audience or customer segment.

The MSFC CIO has identified five dimensions of Service Quality:

- ▶ **Reliability**—Systems/services are available to customers when they need them.
- Responsiveness—CIO effectively listens and responds to a promised service in a timely manner.
- ► **Assurance**—CIO provides tailored products and services based on correct customer understanding.
- **Empathy**—CIO keeps the communication open to understand customer needs.
- ▶ **Tangibility**—CIO is appropriately involved in customer-centric processes from beginning to end. End users know how to use the system.

By leveraging the **Voice of the Customer** and analyzing customer needs, we expect the following results:

- Improved customer experiences.
- Changes to infrastructure and process(es).
- · Lower costs.
- · Higher customer satisfaction.

#### 2.2 IT Governance

IT Governance specifies the decision rights and accountability framework to encourage desirable behavior in the use of IT. IT Governance enables and supports effective decision making; supporting our IT strategy, investments and enterprise architecture.

Effective IT Governance must address three questions.

- 1. What decisions must be made to ensure effective management and use if information technology?
- 2. Who should make these decisions?
- 3. How will the decisions be made and monitored?

Basic elements of IT Governance are already present in the form of Agency and Center IT processes and procedures. At the Center-level, governance structure provides for a Strategic Planning Council (SPC), a Program Management Committee (PMC), and an Integrated Management System Board (IMSB).

Currently, MSFC-managed programs and projects are reviewed for architectural compliance through the EA review process, and MSFC IT services are selected and prioritized through the CPIC process.

In FY 2006, the MSFC CIO will define and utilize a more formalized IT Governance structure to help ensure IT investments meet Agency and Center objectives, while distributing accountability for IT decisions throughout the organization. The MSFC IT Governance structure will define the scope of MSFC CIO oversight, insight, and levels of approval for IT investments.

The resulting IT Governance structure will align with MSFC Center Governance directives. Details of MSFC's IT Governance structure and related processes will be documented in a Marshall directive to be released in FY 2006.

#### Why is IT Governance important?

- · Good IT Governance pays off.
- IT is expensive and pervasive.
- IT Governance is critical to organizational learning about the value of IT.
- IT value depends on more than good technology.



#### The NASA CIO states that CPIC:

"...provides an integrated approach to managing IT through continuous identification, selection, control, life-cycle management, and evaluation of NASA's entire IT investment portfolio. The CPIC process ensures that all IT capital investments align with the Agency's mission, enterprise architecture, and business needs while balancing risk and return throughout each investment lifecycle.

The CPIC process helps answer questions for potential and ongoing investments such as:

- Should the Agency be doing this work at all?
- Can someone else (government agency or private sector) do the work better?
- Is the work organized and being done the best way possible?"<sup>2</sup>

#### 2.3 IT Capital Planning and Investment Control (CPIC)

Following Agency guidelines ensures that the CPIC process produces prioritized investments that are consistent with Center and Agency goals. This is especially true in an environment with multiple requirements vying for limited resources.

Currently, the MSFC CIO performs IT CPIC at various levels within the organization. Primarily IT investments are prioritized at the project/service level, providing a focused, localized perspective of investments. Initially, the MSFC CIO will integrate CPIC efforts into one standard process, ensuring a global, rather than local, view of all MSFC CIO IT investments. Standardizing the IT CPIC process at MSFC will ensure consistency in the identification, selection, control, and evaluation of the IT investments. Next, the MSFC CIO will collate information on IT investments across the Center to provide an integrated view of IT investments at MSFC. This will provide the opportunity to gain insight across multiple programs and projects, allowing the identification of potential investment opportunities that could reduce program cost, improve mission results, or accelerate project schedules.

To ensure future success, the MSFC CIO will follow Agency guidance concerning the CPIC process. Our CPIC process will relate closely to the Agency's process with characteristic elements like a standardized process, analytical approach, defined selection criteria, and a global view of all programs and projects at MSFC. The Agency's CPIC process considers multiple factors, such as strategic and architecture alignment, performance, risk, and return on investment to rank potential investments based on expected value for the Agency. A Marshall directive will be created to ensure that the expectations of the MSFC IT CPIC process are clearly documented, communicated, and utilized.

#### ■ 2.4 Enterprise Architecture (EA)

Enterprise Architecture (EA) can be defined as orderly documentation that clearly defines the current and future states of an enterprise thereby allowing for integrated strategic, business, and technology based decision making by management leaders.

The role of EA in the context of this plan is primarily focused on the clear definition of how EA is integrated with the other identified components and are described later in this section. At this time, the focus of the EA effort for the MSFC CIO is to fully document the current state (As-Is) and the furure vision (To-Be) states of the MSFC CIO EA from the best set of data attainable. An analysis will identify the gaps between the As-Is and the To-Be for each service while also recommending a transition plan to close or eliminate the gaps. This activity is called Gap Analysis.

The MSFC EA stipulates that the Federal Enterprise Architecture Framework (FEAF) be followed when articulating the MSFC CIO EA. Figure 2.4-1<sup>3</sup> describes the fundamental nature of EA. For example, a set of business drivers define a current

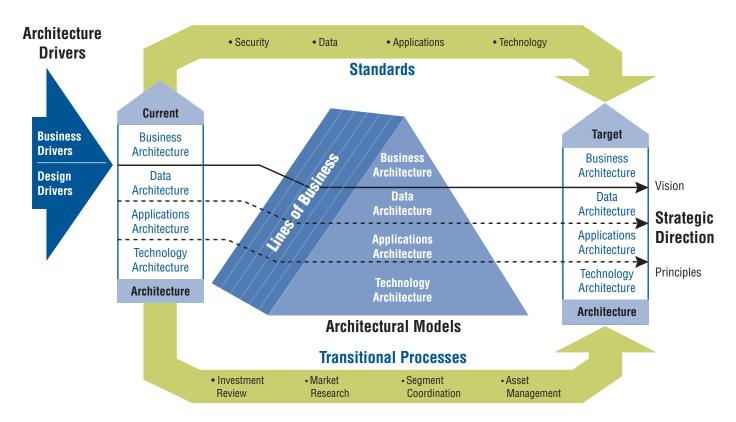


Figure 2.4-1—Federal Enterprise Architecture Framework (FEAF).

architecture comprised of business, technology, and data components. These components define current architecture based on standards. When management provides new business or architecture drivers (requirements), a potential new (target) architecture may be required to adequately address new vision and strategic directions.

According to the Federal EA (FEA) Project Management Office, the FEA "... is entirely business-driven. Its foundation is the BRM, which describes the federal government's Lines of Business (LOB) and its services to the citizen independent of the agencies and offices involved. This business-based foundation provides a common framework for improvement..." Ultimately, the Office of Management and Budget is driving to link all federal capital assets to its LOB.

Likewise, NASA's EA (*NASA Enterprise Architecture Volume 1: Strategies and Overview*, Version 4.0, 2005) links the mission and strategy of an organization to its IT strategy and resources. Additionally, it captures all capital expenditures and identifies how they enable NASA's missions and programs. In this light, the EA is a business and management construct that helps the Agency see how its diverse and complex components work together to drive the NASA mission. Figure 2.4-2 depicts the conceptual structure of the MSFC EA and how the Agency mission directorates map

**Business Reference Model (BRM)** 

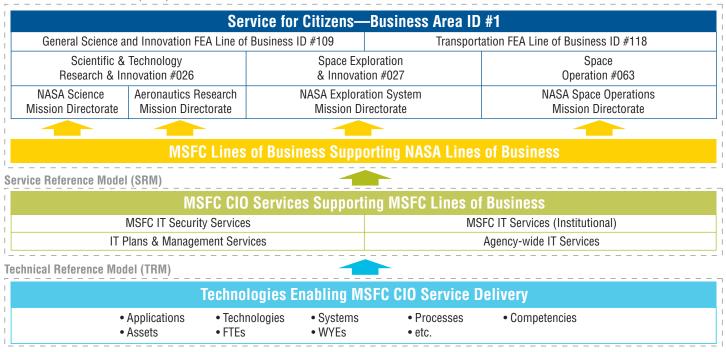


Figure 2.4-2—Conceptual Structure of the MSFC Enterprise Architecture (EA).

into the FEA BRM classifications that apply to NASA as an agency and how the MSFC CIO services support the MSFC LOB.

#### ■ 2.4.1 MSFC EA Reference Models

It should be noted that the construction and meaning of the MSFC EA reference models (BRM, SRM, and TRM) are different from the FEA reference models. The FEA reference models provide a framework for all federal agencies to classify the elements of their respective EA while the MSFC EA reference models provide MSFC-specific information relating to business, services, and technology relationships. The following sub-sections refer to the MSFC EA reference models.

#### MSFC Business Reference Model (BRM)

As a top-down business and management construct, the MSFC EA must clearly define the Center's current LOB. This As-Is definition, when mapped to Agency-level LOB and services is termed BRM. The MSFC BRM will clearly demonstrate how MSFC fits within the overall goals and direction of the Agency.

As the Agency evolves over time, strategies may change and goals and objectives may be re-prioritized, which may result in a transformation of Agency's LOB. If that transformation is significant enough, MSFC LOB may also need to transform to maintain alignment with Agency's LOB. The identification and design of this realigned transformation to Agency LOB is termed the To-Be BRM. Any change to MSFC lines of business (e.g., Center roles and mission assignments, etc.) may necessitate new To-Be versions of the BRM.

#### MSFC Service Reference Model (SRM)

Supporting the Center and Agency LOB are many organizations, functions, and initiatives. EA uses the term "services" to describe those business functions that enable the Center's (and Agency's) LOB. The SRM is the overall construct that identifies what those services are, which LOB they support, and how they support the LOB.

Services at MSFC are numerous and complex. The Center EA team is currently involved with identifying the current suite of MSFC CIO services and characterizing them in terms of what we deliver and to whom. Ultimately, these services will be mapped to MSFC LOB. The product of this effort will be the As-Is SRM for the MSFC CIO.

The identification of To-Be states and the resultant realignment with the Business Reference Model becomes a perpetual process in the ongoing management of the Enterprise Architecture.

Like the BRM, MSFC CIO Services may need to periodically transform to maintain alignment with the LOB they support. As the BRM changes with shifts in Agency or Center missions, strategic goals, etc., MSFC may need to add services, retire services, or change service focus. The resulting new group of services will be termed the To-Be SRM, until it is implemented, at which point it becomes the new As-Is SRM. Other events that may necessitate new To-Be versions of the SRM are new technology advancements that change the nature of services provided or new business models that transform the structure of the service.

#### MSFC Technical Reference Model (TRM)

The foundational layer of the MSFC CIO EA is composed of multiple types of supporting infrastructure and activities that enable the MSFC CIO Services. Enabling components include:

- Applications
- Systems
- Business Processes

- Workforce
- Facilities
- Hardware

- Financials
- ▶ etc...

The Center EA team will gather inventories and other information in the technology layer and map them to each other and to the services they support. This TRM, will become the initial iteration of the As-Is state. The To-Be state of the MSFC TRM will be derived through the identification of technology layer components that are incorrectly aligned with services, services that are unsupported by the technology layer, or redundant technology components.

The identification of To-Be states and the resultant realignment with the SRM becomes a perpetual process in the ongoing management of the EA.

# The To-Be state of the Technical Reference Model will incorporate:

- Strategic direction and changes to the Service Reference Model
- Advances or innovations in technology, including those identified in ITEP.
- Business practices that enhance the capabilities of the technology layer.

#### **2.4.2** EA Inputs

Updates to the MSFC EA come not only from changes in NASA missions, goals and objectives, but from areas such as VOC, the ITEP and to some degree, Governance.

It is important to recognize customer needs as a barometer of change. Through the VOC, future requirements are identified and validated by the MSFC CIO Service Owners. These needs can translate into either enhanced or new service offerings. In addition, the ITEP will identify validated technologies that can become candidates for a future state architecture. For example, through the ITEP, a new technology

can be suggested to increase efficiency and lower cost of a particular service thereby changing the architecture. The Governance aspect of EA provides a structure for making decisions regarding change within the enterprise. Formal processes to govern decisions are mandatory within the architecture and play an important role in EA.

#### ■ 2.4.3 EA Outputs

Once completed, the NASA EA will provide an enterprise view of IT services and assets and how they support the NASA missions. Each periodic analysis of the MSFC As-Is state of the EA, including What-If and Gap Analyses, will highlight inefficiencies, redundancies, and gaps that, once corrected, will more closely align the MSFC enterprise with the Agency. The outputs of these analyses also drive other IITPF components, including ITEP and IT CPIC. The end of the As-Is, To-Be, and Gap Analysis cycle supports the Program Operating Plan (POP) and CPIC process.

#### **What-If Analyses** of EA help answer the questions:

- ► How would MSFC CIO services and supporting technologies be impacted if a major NASA mission significantly shifted its focus?
- ► How would the NASA business benefit from enhancements to the business model, structure, or business processes of a given service? What would the impact be to the technology layer?
- How would the NASA business and services benefit from significant advancements in a given technology?
- ▶ Which users would be affected if the Center lost a system or removed a location from a network? Which business processes would be degraded?
- How would the EA be impacted by business decisions to add or subtract capability?

#### **Gap Analyses**

- Which assets provide redundant support to services?
- ▶ Which services provide redundant support to the business and should be sunset?
- ▶ Which assets in the inventory can be leveraged across services?
- Which especially strong services can be leveraged to other businesses or federal agencies?
- ▶ Which assets need to be in place to transition to the To-Be state?

Results of the EA gap analyses drive the IITPF, specifically ITEP.

As Enterprise Arcitecture matures over the coming year, MSFC CIO Service Owners will continue to gain insight into their customer's strategic goals, objectives, and To-Be states.

#### **MSFC CIO Services To-Be State**

Over the next five years, MSFC CIO Services will initiate a number of changes that will enhance alignment with customer needs, future EAs, and new competitive business environments. These changes represent the future, or To-Be state of IT services from the perspective of the MSFC CIO Service Owners.

Services will reconcile this initial iteration of their To-Be state with NASA's overall To-Be architecture, industry best practices, and customer needs.

The VOC directly influences EA To-Be states. EA also directly influences the IT CPIC process as shown in Section 2.3.

In the coming years, the MSFC CIO will continue to align our services architecture with the goals and objectives of the Agency by gaining key insight to business requirements through a common requirements vision. Strategic partnerships and a robust EA will provide the MSFC CIO with opportunities to better plan, manage, and control IT investments.

The next iterations of EA will refine these To-Be states, ensure alignment with the Agency and customer To-Be states, and identify gaps and potential strategies for gap reduction.

#### 2.5 Information Technology Evaluation Program (ITEP)

The ITEP provides the vision to recognize trends in forward-thinking technologies and the ability to integrate these technologies into products and services enabling customers to perform their work more efficiently and effectively. The ITEP evaluates the relevancy of a technology to mission priorities as outlined in the Center's Strategic Plan, identifies and shares lessons learned from previous implementations of this type of technology, and ensures the technology fits with the Center's EA.

The ITEP consists of the following major components:

- Information Technology Evaluation Process.
- ▶ Information Technology Focus Groups.
- ▶ Information Technology Evaluation Database.
- ▶ Information Technology Council.

Figure 2.5-1 illustrates the integrated nature of ITEP and shows the relationships between the ITEP component and the external entities that provide inputs and receive outputs from the ITEP process. In addition, the figure shows how information generated as a result of this interaction is centrally accessible through an ITEP SharePoint  $^{\text{TM}}$  site.

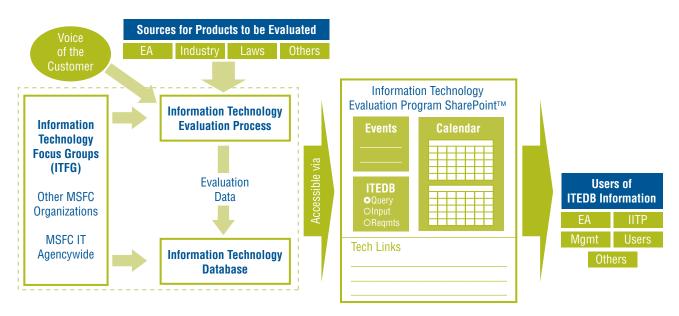


Figure 2.5-1—Information Technology Evaluation Program (ITEP)—Integrated View.

#### ■ 2.5.1 Technology Evaluation (TE) Process

The technology evaluation (TE) process provides a consistent methodology for identifying candidate technologies that are architecturally compliant, ready for insertion into the existing infrastructure, and effectively managed for risk and cost through the incorporation of classic systems engineering methodologies.

The technology evaluation process consists of three steps:

- 1. Identify Technology
- 2. Characterize Technology
- 3. Validate Technology

Figure 2.5.1-1 shows the TE process and describes the overall technology evaluation domain and specifically identifies the core components of the process.

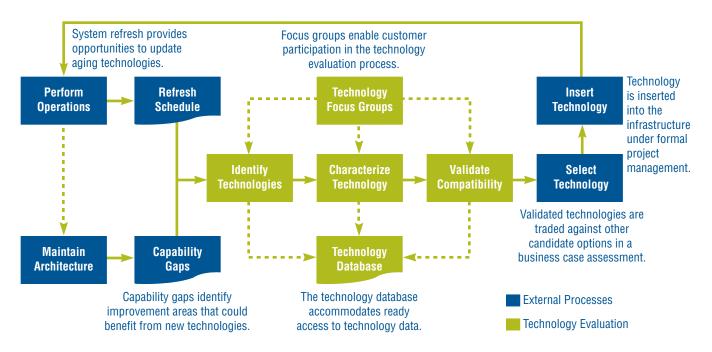


Figure 2.5.1-1—Technology Evaluation Process.

**Identify Technology** is the identification of candidate technologies for evaluation and can come from various sources including; focus groups, customers, EA, and vendors. In order to provide consistency across other components of the IITPF, the identification or classification of a particular technology is based on the EA TRM. Once a technology is identified, an Owner is assigned (according to the TRM

structure) and a systematic approach is applied to begin evaluating the technology. An Evaluation Team will be formed to capture such information as vendor name, capabilities, value features, preliminary cost data, and maturity level. This data then resides in the ITEDB. At this point, the technology owner decides to either hold the technology for future evaluation or recommend the next step in the process be executed.

**Characterize Technology** determines the readiness of a technology as a candidate for insertion into the architecture. The value in this process step lies in ensuring an apples-to-apples comparison with other candidate solutions and providing a rationale for eliminating candidates from consideration, holding them back for future evaluation or proceeding with possible insertion into the operational baseline architecture.

The value in this process step lies in the ability to ensure an apples-to-apples comparison with other candidate solutions and the ability to provide a rationale for eliminating the technology from consideration, holding back the technology for future evaluation, or proceeding with possible insertion into the operational baseline architecture. As with the Identify Technology step, all technology characterization information is captured in the ITEDB and is made available to stakeholders.

**Validate Compatibility** is the final step in the core technology evaluation process. This is where the compatibility of all candidate technologies (new and mature) with the current infrastructure is determined. The technology owner will develop a Validation Plan consisting of requirements, schedule, approach, responsibilities, resources, and criteria. The Validation Team performs validation testing to ensure the insertion of the technology will not negatively affect the operational baseline architecture. A recommendation concerning the insertion of the new technology is documented. All test results and information are captured in the ITEDB.

As depicted in Figure 2.5.1-1, "Technology Evaluation Process," control of the technology evaluation decision making is then transitioned to an external management process where the validated technologies are traded against other options under a business case perspective. When a technology is chosen for insertion into the operational baseline architecture, a Project is formally initiated and all project management processes take control.

Through analysis and a proper level of testing, essential technology characterization data is captured. The following list identifies the type of data captured:

- Performance
- · Technology Readiness Level
- Life Cycle Cost
- Schedule Availability
- Reliability and Maintainability
- Standards Compliance
- Benchmark Data
- Evaluator Opinion.



# 2.5.2 Information Technology Focus Groups (ITFGs)

A core element of the ITEP is the Information Technology Focus Group (ITFG). An ITFG is a community of technology enthusiasts grouped by a common technology interest. The group can be comprised of a variety of participants including subject matter experts, power users, and those with a strong interest in a particular technology. The ITFG structure provides a mechanism for these enthusiasts to gather and exchange new ideas on a specific technology or technology area. The ITFG facilitates this information sharing among group members through group discussions and occasional guest speakers. These discussions not only provide the characterization and validation inputs for technology recommendations but may also result in the identification of process improvement opportunities and support the governance process by providing policy recommendations through participation in committees that support the Governance process.

SharePoint<sup>™</sup> collaboration space is provided for each ITFG to facilitate the transfer of information among the community members, capture key characterization information on emerging technologies, allow member access to the ITEDB, and provide a virtual meeting place for the user community. Through the ITFG SharePoint <sup>™</sup> site, participants can share new ideas, request information, and access lessons learned in an effort to advance the utilization of technology for the greater MSFC community.

The ITFG provides a positive channel for the flow of information and provides a valuable resource for obtaining VOC. As mentioned previously, the ITFG provides valuable support to the overall technology evaluation process by submitting technology and process improvement recommendations. In addition, the ITFG can support the testing of new technologies.

# ■ 2.5.3 Information Technology Evaluation Database (ITEDB)

The ITEDB is the central database that contains all information generated as a result of the different steps of the technology evaluation process. Access to the ITEDB is obtained via the ITEP SharePoint™ portal and is allowed for all authorized users. The ITEDB provides this valuable technology evaluation information to users such as architects, planners, management, operations staff, customers, and other authorized users. By leveraging this repository of technology evaluation information, users are able to save valuable time by precluding the need for researching and collecting this information themselves.

# ■ 2.5.4 Information Technology Council (ITC)

The ITEP incorporates other key mechanisms to inject technology innovation into the IITPF. One such mechanism is the MSFC CIO Information Technology Council (ITC). The ITC, comprised of both MSFC CIO and contractor personnel, is a decision-making group that will provide guidance to decisions regarding the utilization of contractor corporate-sponsored funds for evaluating advanced technology as proposed by a Technology Champion.

Each technology evaluation proposal to the ITC must satisfy the following criteria in order to be considered a viable candidate for investment:

Must involve the introduction of a new or emerging technology, tool, or methodology.

► Technology assessment must be relevant to NASA and provide a tangible benefit for NASA and in alignment with NASA vision.

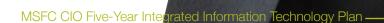
► Technology must be mature enough to have a reasonable probability of a successful evaluation and subsequent implementation into production.

Technology must have a favorable qualitative business value proposition.

The Technology Champion presents a Proposal Brief for each proposal to the ITC. As decision to approve or disapprove the proposal is made by the Co-Chairs based upon input from key personnel on the ITC. Specific status information concerning each proposal will be maintained on the ITEP SharePoint™ page.

The ITEP provides a single-point focus to effectively coordinate the evaluation of candidate technologies across the Center and provides a common database to capture relevant evaluation data and provide access to this information through a taxonomy structure based on the EA TRM. By leveraging this information, superior IT investment decisions can be made.

The five component pieces of the Integrated IT Plannning Framework (IITPF) work together, influencing each other and our overall IT planing, allowing us to make better IT investment decisions.



What is our time table?



# 3 Times of the linter

# Timeframe of the Integrated IT Planning Framework

The IITPF is our approach to managing IT through a disciplined methodology that ensures IT investments are strategically aligned to support the Center and Agency. Over the next five years, the MSFC CIO will realize the full benefit of this integrated framework to guide our future direction and IT investment decisions. The IITPF key events (see table 3-1) over the next five years is categorized into three phases:

- 1. Develop Initial Capabilities
- 2. Utilize and Refine Full Capabilities
- 3. Manage IT based on Strategic Customer Insights.

### Table 3-1—IITPF Phases.

# Phase 1 Develop Initial Capabilities

- Develop Agency Customer-Centric Strategy
- Refine MSFC Customer-Centric Strategy
- Define, finalize and implement IT Governance structure, roles and responsibilities, and process
- Develop, finalize, and apply standardized CPIC process to manage MSFC CIO IT investments
- Complete EA cycle for initial scope of MSFC
  CIO
- Begin transition to IT investment management based on integrated IT Governance, IT CPIC, and EA processes
- Finalize the ITEP technology evaluation (TE) process
- Initiate and facilitate candidate ITFGs as they are identified
- · Develop ITEDB and web-based interface
- Utilize UNITeS Technology Council

# Phase 2 Utilize & Refine Full Capabilities

- Refine Customer-Centric Strategy
- Establish customer service performance measurement processes
- Manage and monitor the status of customer service improvement initiatives
- Utilize IT Governance structure and process
- Review, refine, and expand IT Governance process
- Apply standardized CPIC process to Centerwide IT investments
- Baseline map of IT services to business areas
- Identify service trends, gaps, and EA realignment opportunities
- Begin transition of current architecture into EA compliance
- Refine data in existing EA "As-Is" and "To-Be" states
- Manage IT investments based on integrated IT Governance, IT CPIC, and EA process
- Utilize ITEP TE process and UNITeS Technology Council
- Continue to initiate and facilitate candidate ITFGs as they are identified

# Phase 3 Manage IT Based on Strategic Customer Insights

- Utilize EA and VOC to gain strategic view of customer business trends and needs
- Continue implementing customer service technology improvements
- Manage IT investments strategically based on refined and integrated VOC, IT Governance, IT CPIC, EA, and ITEP
- · Identify EA long-term "To-Be" state
- Continue transition of architecture into EA compliance
- Continue to refine data in existing Enterprise Architecture
- Continue to initiate and facilitate candidate ITFGs as they are identified
- Achieve customer Information Technology awareness through ITEP TE process, ITFGs, and distributed ITEDB

The IITPF matures as it evolves over time. Similarly, our customer-focused IT planning capabilities increase over time as we gain more customer insights that drive our future direction (fig. 3-1).

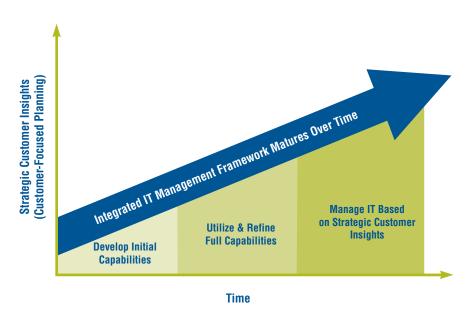


Figure 3-1—IT Strategic Management Maturity Model.

Details of the three phases in the timeframe of the IITPF are discussed next.

# ■ 3.1 Develop Initial Capabilities

In the first phase, the MSFC CIO plans to develop the enhancements which enable integrated IT planning in order to begin the transition of IT investment management based on integrated IT Governance, IT CPIC, and EA processes. Key activities in this phase include:

# Voice of the Customer (VOC)

- Refine Customer-Centric Strategy for MSFC Conduct follow up customer experience research (interviews, surveys and focus groups) to evaluate progress against baseline findings for MSFC customers. Identify new customer service and service delivery improvement opportunities based on findings.
  - Customer Satisfaction Surveys: Use service dimensions to organize our approach and pinpoint our tactical understanding of which areas of customer support need corrective actions.
  - Focus Groups to gain deeper insight into a problem experience with targeted users and test out proposed customer service improvement initiatives.

- ► Conduct Customer Experience research for Agency-wide customers.
  - Compare the data with the findings from the MSFC research.
  - Develop Agency-wide Communication Materials Review (CRM) recommendations.
- Manage and monitor the status of customer service improvement initiatives.

## IT Governance

- ▶ Define IT Governance structure, policies, roles and responsibilities.
- ▶ Run test cases through IT Governance structure and identify gaps.
- ▶ Identify potential automation points—determine if current systems can be utilized or if automation will require new tools.
- ▶ Identify and implement necessary changes/refinements to processes.
- ▶ Complete Marshall directive for MSFC IT Governance.
- ► Finalize and implement IT governance structure and processes.

# Capital Planning and Investment Control (CPIC)

- ▶ Develop and finalize CPIC process to manage IT investments.
- Apply standardized CPIC process to MSFC CIO IT investments.

# **Enterprise Architecture (EA)**

- ► Complete the EA cycle for initial scope of MSFC CIO, including:
  - Develop initial EA As-Is and To-Be states:
    - Identify and model BRM
    - · Identify and model SRM
    - Identify and model TRM
  - Perform Gap Analysis between As-Is and To-Be architectures: Establish and prioritize implementation strategies to close the gaps.
  - Develop initial EA realignment recommendations.
- Provide guidance into EA Review Process: Provide guidance and assistance to projects and service groups that will help them to successfully negotiate the EA Review Process.

# **Information Technology Evaluation Program (ITEP)**

- ▶ Finalize the ITEP Technology Evaluation (TE) process.
- ▶ Initiate and facilitate candidate ITFGs (e.g., IT security and wireless.)
- Develop the ITEDB and web-based interface.
- ▶ Convene ITC.



# 3.2 Utilize and Refine Full Capabilities

In the second phase, the MSFC CIO plans to implement and utilize the full set of capabilities of the IITPF, demonstrating IT management and decision-making that integrates individual components. This phase will also see the ongoing refinement and execution of component processes, such as IT Governance and CPIC.

In the second phase of the IITPF, the MSFC CIO intends to:

- Refine Customer-Centric Strategy—Conduct follow up customer experience research (interviews, surveys and focus groups) to evaluate progress against baseline findings for MSFC- and Agency-wide customers. Identify new customer service and service delivery improvement opportunities based on findings.
- Establish customer service performance measurement processes and systems to monitor customer behaviors and satisfaction. Develop real-time visibility via a dashboard-type score card that rolls up all individual measures to a center or Agency-wide view.
- ▶ Manage and monitor the status of customer service improvement initiatives.
- Utilize IT Governance structure and process
- ▶ Review, refine, and expand IT Governance program annually.
- ▶ Apply standardized CPIC process to Center-wide IT investments.
- ▶ Drive *Five-Year IITP* with CPIC outputs.
- ▶ Baseline the map of IT services to business areas.
- ▶ Identify service trends.
- ▶ Identify gaps and EA realignment opportunities.
- ▶ Begin initial IT realignment recommendations.
- ▶ Begin transition of current architecture into EA compliance.
- ► Expand scope of the ongoing EA cycle to include the Engineering Directorate, Safety and Mission Assurance Directorate, and Science and Technology Directorate (including As-Is and To-Be modeling and Gap Analysis.)
- ▶ Refine data in the existing EA As-Is and To-Be states.
- ▶ Continue to engage projects and services in the EA Review Process.
- ▶ Drive *Five-Year IITP* with EA outputs.
- ▶ Utilize the ITEP TE process and ITC.
- ▶ Initiate and facilitate additional candidate ITFGs as needed.
- Utilize ITEDB and web-based interface.

# 3.3 Manage IT Based on Strategic Customer Insights

The third consists of utilizing a maturing IITPF to strategically manage IT, basing investment decisions on strategic customer insights. Mature component processes are executed cyclically, driving annual IT investments. Our strategically-aligned, long-term plan is customer-centric and influenced by technology advancements.

In this final phase, key events in the IITPF are fully integrated and include:

- Utilize EA and VOC to gain strategic view of customer business trends and needs.
- ► Continue implementing customer service technology improvements.
- ► Manage IT investments strategically based on refined and integrated VOC, IT Governance, IT CPIC, EA, and ITEP process.
- ► Identify EA long-term To-Be state (with insight into what is needed to achieve long-term Agency exploration objectives).
- Continue transition of architecture into EA compliance.
- Continue to refine data in existing EA.
- ► Initiate and facilitate additional ITFGs as needed.
- Achieve customer IT awareness through ITEP TE process, ITFGs, and distributed ITEDB.





What are our intitiatives?

Where are we today?

Where are we headed in the future?

# 4

# MSFC CIO Initiatives Aligned With Objectives

In support of CIO's Vision and Mission, and to ensure our work is consistent with the Agency's Mission and MSFC Goals, six MSFC CIO Organization Objectives have been developed:

- 1. Provide a robust and interoperable information technology infrastructure.
- 2. Ensure IT resources and infrastructures are secure and accessible.
- 3. Deliver innovative, quality products and services.
- 4. Be the leader in delivering Agency information technology services.
- 5. Balance and optimize IT investments, development, standardization. (Review IT architecture to ensure it does not become obsolete.)
- 6. Lead the technical and business management of IT resources at MSFC.

These Organization Objectives directly align with two of the three MSFC Goals. Objectives One through Four align with the first MSFC Goal, Superior Execution of Assigned Programs and Projects. Objectives Five and Six align with MSFC Goal Three, Organizational Management Excellence (fig. 4-1). Our support of these two goals enables the support of MSFC Goal Two, Secure Key Roles in Space Exploration Development.

## **MSFC Goal One**

 Superior execution of assigned programs and projects

### **MSFC Goal Two**

 Secure key roles in space exploration development

### **MSFC Goal Three**

 Organizational management excellence

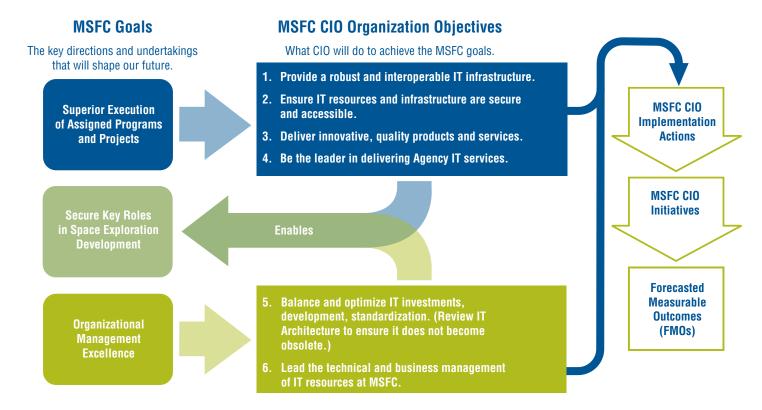


Figure 4-1—MSFC CIO Implementation management structure enabling Agency and Center goals.

## **MSFC CIO Vision:**

People, technology, and information working together for NASA.

## **MSFC CIO Mission:**

Enabling MSFC's success through information technology leadership.

Figure 4-2 shows the structure that guides MSFC CIO work efforts, helping to ensure our objectives and actions align and provide measurable results. MSFC CIO Organization Objectives align to MSFC Goals to execute the Agency's strategy. The MSFC CIO plans to execute the MSFC CIO Organizational Objectives through specific, measurable Implementation Actions. Each MSFC CIO Organization Objective maps to a set of MSFC CIO Implementation Actions. Forecasted Measurable Outcomes are then defined to reflect the performance of each set of Implementation Actions and to ensure desired results.



Figure 4-2—MSFC CIO Implementation management structure to meet Agency and Center goals.

MSFC CIO Initiatives are the foundation of and means to execute our Implementation Actions. These initiatives are the IT services, programs, and projects in which we invest to execute the requirements that demonstrate performance of Agency and Center goals.

The following sections detail specific MSFC CIO Implementation Actions, FMO intent, and examples of planned MSFC CIO Initiatives aligned with each Organization Objectives. This provides insight into the short- and long-term actions of our organization. Insights and trends for the next five years and beyond are also discussed, including emerging areas and technologies of IT and how these can be used to address future customer requirements.

Two categories of planned MSFC CIO Initiatives are referenced in this document:

- ▶ Develop/Modernize/Enhance (DME).
- Steady State (SS).

DME initiatives are primarily investments in new development and SS initiatives are primarily investments in sustaining operations. Initiatives are categorized based on

the Agency CIO definitions for Office Automation, IT Infrastructure, and Telecommunications (OAIT), Multi-Program/Project IT (MP/MP), and Program Specific/ Unique IT (PS). The current view of MSFC CIO DME Initiatives aligned with the primary Organization Objective they support is found in the remainder of Section 4. MSFC CIO SS Initiatives aligned with the primary Organization Objectives they support are found in Appendix D. A comparison of MSFC CIO DME Initiatives by Organization Objective is shown in figure 4-3.

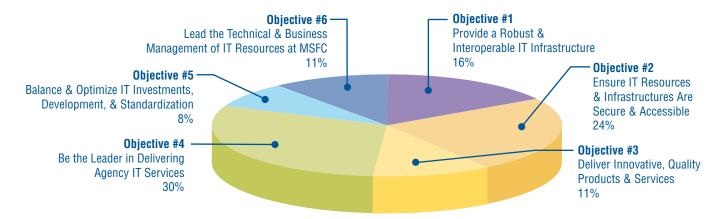


Figure 4-3—Comparison of MSFC CIO DME Initiatives by Organization Objective.

MSFC CIO Initiatives shown for FY 2006 comprise the current first year implementation view. MSFC CIO Initiatives shown for FY 2007–FY 2010 comprise the current forecast for years 2–5 of this five-year plan. Once DME Initiatives are implemented, they become SS in the out-years.

# 4.1 MSFC CIO Organization Objective One: Provide a Robust and Interoperable IT Infrastructure

A robust and interoperable IT infrastructure is a fundamental need in implementing NASA's mission. A robust IT infrastructure is required to enable communication, collaboration, and information sharing; to meet the varied scientific, technical, and business needs of our customers; and to allow the most effective use of available resources to help ensure the Agency's mission is affordable.

Table 4.1-1—MSFC CIO Implementation actions and performance measures, FMOs, and examples of planned initiatives providing a robust and interoperable IT infrastructure.

MSFC Goal One—Superior Execution of Assigned Programs and Projects  MSFC CIO Organization Objective One— Provide a Robust and Interoperable IT Infrastructure					
MSFC CIO Implementation Actions   Intent of Forecasted Measurable Outcomes (FMO)   Examples of Planned MSFC CIO Initia					
Operate and maintain secure voice, data, and video services	► Highly Available Voice and Networks	<ul> <li>Building 4600 Network Installation</li> <li>Video Teleconferencing Services (ViTS)</li> <li>Disaster Recovery (DR) and Continuity of Operations Planning (COOP)</li> </ul>			
Ensure continuity of operations for mission critical systems and services	<ul> <li>Upgraded Document Management Capabilities</li> <li>Campus-wide plan for secure wireless access</li> </ul>	<ul> <li>Integrating and Upgrading Document         Management Services</li> <li>Implement Secure Wireless Access for         Authorized Users</li> </ul>			
Drive cost savings through technology optimization and rationalization	<ul> <li>Completed evaluation and pilot of Voice over IP (VoIP)</li> <li>Completed ED IT optimization study</li> <li>Conducted MSFC-wide Data Architecture Study</li> </ul>	<ul> <li>Voice over IP (VoIP)</li> <li>Video over IP (ViIP)</li> <li>Video/Voice over wireless IP</li> <li>Integrated Engineering Capability Design</li> </ul>			
Integrate, consolidate, and eliminate redundant legacy systems/services	, and the second	& Data Management System (and Windchill)  Integrated Collaborative Environment (ICE)  NASA Collaborative Infrastructure (NCI)			

# ■ 4.1.1 Highlights of Initiatives and Trends

MSFC CIO Initiatives in the following areas support our first Organization Objective—to provide a robust and interoperable information technology infrastructure:

- Networking.
- Mobile Computing.
- ▶ Disaster Recovery & Continuity of Operations.
- ▶ Document Management.

# Networking

MSFC CIO key networking initiatives aligning to Objective One over the next five years include network enhancements and the transition from commercial voice and video services to voice and video over Internet protocol (IP).

- ▶ Voice and Video Over Internet Protocol (VoIP and ViIP)

  Because of the expanded capacity offered by the wide-area network (WAN)
  enhancement, the MSFC CIO is piloting Voice over IP (VoIP) and Video over
  IP (ViIP) capabilities over the WAN. The MSFC CIO expects two windfalls
  from these efforts: increased secure communications and cost savings.
  - Transitioning voice and video to a private network instead of commercial lines will increase secure communications capabilities. Secure, in-house communications are especially important to customers such as the Langley Research Center (LARC) NASA Engineering Safety Center (NESC). Currently, NASA Information Services Network (NISN) is providing collaborative Video Teleconferencing Services (ViTS) capability over commercial lines to NESC at Ames Research Center, Dryden Flight Research Center, Glenn Research Center, Jet Propulsion Laboratory, Johnson Space Center, LARC, MSFC, and Stennis Space Center.
  - Cost savings from the transition to VoIP and ViIP will result as the marginal
    costs for adding voice and video capabilities to the enhanced WAN are less
    than maintaining commercial voice and video services.

A potential next step for VoIP and ViIP may be the merger with wireless technology. The MSFC CIO is currently tracking technological innovations around voice and video over wireless IP. Wireless IP telephones could interface with wireless local-area networks (LANs) on any campus to make this a reality. The MSFC CIO will explore the possibility of beginning implementation by 2008, with a goal of hosting a robust wireless video/voice over wireless IP by 2009.

## MSFC Local-Area Network (LAN)

The LAN Network Management center is collocated with the NASA Information Support Center (NISC) and Outsourcing Desktop Initiative for NASA (ODIN) server administrators. The center utilizes CiscoWorks<sup>™</sup> to manage wired and wireless LANs, ensuring a high degree of collaboration with IT Security and Network Operations.



Network enhancements and potential new networking projects and technologies being considered at MSFC over the next five years include:

- Implementing gigabit (Gb) wired LAN to each MSFC desktop in an effort to increase speed and efficiency.
- Implementing wireless LAN throughout the Center, to include implementing new applications around work control and work order processing via personal digital assistants (PDA).
- Implementing Gb Ethernet for the Huntsville Operations Support Center (HOSC) *ISS* Downlink Enhancement Architecture (IDEA).

# Mobile Computing and Technology

The MSFC CIO provisions hardware and software, addresses problems, and evaluates future Center offerings for mobile technology and computing. The CIO staff uses wireless e-mail devices such as the TREO.3 ™ and Blackberry ™. From 2006 to 2007, the CIO staff will explore the feasibility of replacing some laptop computers with mobile technology devices. These devices are beginning to provide standard desktop computing capabilities merged with mobile telephony and e-mail services.

The MSFC community is already migrating from standard desktop equipment to laptop computers. This trend toward work portability is currently one focus for our organization. ODIN currently provides tablet personal computers (PC) that are the next generation of laptop computing. In the next five years, we envision tablet PCs becoming smaller, being carried in portable "portfolios," and incorporating wireless voice capabilities. Should this technology continue to mature, tablet PCs will become the converged device that provides information accessibility any-time, any-where.

# Disaster Recovery and Continuity of Operations

The MSFC CIO is developing and communicating a more holistic vision of Disaster Recovery (DR) and Continuity of Operations Planning (COOP). Currently, DR is viewed as application- or infrastructure-specific. Current DR plans identify discrete pieces of infrastructure and detail how they will be restored in the

event of an outage. New DR approaches will be more system- and customer-centric. DR plans will be developed that detail restoration procedures of mission and business-enabling capabilities.

# **Document Management**

There are a number of potential new projects and technologies being planned for the next five years. These include:

- ► Implementing Documentum<sup>™</sup> as the standard document management solution Agencywide.
- ► Implementing Documentum<sup>™</sup> capabilities to store images and video.
- ▶ Implementing digital signature capability to enhance automated workflow.
- ► Centralizing knowledge libraries across the Center.
- Transitioning Document Management Services, including graphics, reproduction, multimedia, and imaging, into a single facility. This will drastically reduce the time customers spend traveling to different facilities to fulfill an order. Integrating these services within one facility will provide end-to-end, one-stop shopping for customers.

# MSFC CIO Initiatives provide a robust and interoperable IT infrastructure that supports numerous Agency and Center mission areas including:

- Space Operations Missions:
  Space Shuttle Return to Flight
  (and the NASA Engineering
  Safety Center), International
  Space Station completion, and
  international partnership and
  collaboration with Russia.
- Exploration Systems Missions: Crew Launch Vehicle (CLV) and Robotic Lunar Exploration Program (RLEP) lunar lander.
- Science Mission programs and projects.

# ■ 4.1.2 Planned MSFC CIO Initiatives

**Develop/Modernize/Enhance (DME)** Initiatives that support Organization Objective One and the years in which they are planned are shown in figure 4.1.2-1.

# MSFC CIO Organization Objective 1: Provide a robust and interoperable information technology infrastructure

MSFC CIO Initiatives	Category	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Support development, deployment, and operation of the Integrated Engineering Capability Design & Data Management System	MP/MP	DME		S	S	
Integrated Collaborative Environment (ICE)	MP/MP	DM	Е		SS	
Upgrade Center document management capabilities	OAIT	DM	E		SS	
Windchill Implementation Integrated Engineering Capability	MP/MP	DM	Е		SS	
VoIP Pilot	OAIT		DME		SS	;
Implement secure wireless access for authorized users	OAIT		DMI	E		SS

Figure 4.1.2-1—MSFC CIO DME Initiatives providing a robust and interoperable IT infrastructure.

**Steady State (SS)** initiatives aligned with Organization Objective One are shown in the Appendix D tables.

# ■ 4.2 MSFC CIO Organization Objective Two:

# Ensure IT Resources and Infrastructures Are Secure and Accessible

In order for our customers to make use of the IT infrastructure, it must be accessible. In order to ensure the availability and integrity of the IT infrastructure, it must be secure. Our organization emphasizes the security and accessibility of information technology resources and infrastructures in the services we provide.

Table 4.2-1—MSFC CIO Implementation Actions and Performance Measures, FMOs, and Examples of Planned Initiatives to ensure IT resources and infrastructures are secure and accessible.

MSFC Goal One—Superior Execution of Assigned Programs and Projects					
MSFC CIO Organization Objective Two—Ensure Information Technology Resources and Infrastructures are Secure and Accessible					
MSFC CIO Implementation Actions	Intent of Forecasted Measurable Outcomes (FMO)	Examples of Planned MSFC CIO Initiatives			
Deploy and operate robust patch management and reporting services	► Patchlink Deployed on ODIN systems	► Patchlink			
Provide secure physical and logical access to Agency-wide resources	➤ Smartcard technologies used to re-badge MSFC Civil Service employees	Common Badging and Access Control System (CBACS)			
Implement and operate a comprehensive end-to-end IT Security program	<ul> <li>Mitigated IT vulnerabilities</li> <li>Certified IT system administrators</li> <li>Completed IT security training required for MSFC</li> </ul>	► IT Security Center Phase II  ► NASA Cyber Attack Response System (NCARS)  ► Intrusion Detection System Router Upgrade			
Ensure compliance with IT System certification and accreditation (C&A)	employees	► Perimeter firewall infrastructure ► Center IT system C&A			

# ■ 4.2.1 Highlights of Initiatives and Trends

MSFC CIO Initiatives in the following areas support our second Organization Objective—ensure IT resources and infrastructures are secure and accessible:

- ► Tools and Applications
- Management Processes.

# **Tools and Applications**

The MSFC CIO is committed to delivering quality IT security capabilities to protect IT assets, employee and contractor information, and IT facilities. The MSFC CIO uses IT security tools and applications to help us achieve these capabilities. The MSFC CIO has been assigned the responsibility for implementing the Agency Common Badging and Access Control System (CBACS), which will provide physical access and a common badging technology for the security of all NASA facilities, personnel, and assets. NASA employees and contractors will be able to use "smart

badge" technology to transport their personal preferences and security permissions to any location around the Agency. The MSFC CIO has coordinated closely with facility and Center security to install centralized servers and new badging applications.

data data dat

The MSFC CIO currently maintains the **NASA Cyber Attack Response System** (**NCARS**) which provides security functions for the WAN. NCARS uses government off-the-shelf (GOTS) technology to detect attempted intrusions and provides a dashboard view for actionable events.

The MSFC CIO maintains the **IT Security Center (ITSC)** at MSFC and is examining the opportunity to extend this capability to the Agency. The ITSC is an in-house developed application that provides management data to security personnel (ITSM, ITS staff, CSO) so they can perform and monitor all aspects of the IT Security Program. The MSFC CIO is examining plans for a Phase II rollout that will provide the capability to automatically generate security plans with approval workflow. Eventually, the ITSC will have vulnerability assessment data and hardware data for the NASA Acquisition Management System (NAMS). The next version of ITSC will be web-enabled. The application is currently running at MSFC, but may be rolled-out to the Agency as a "Security Dashboard" for managing the Agency IT Security Program at all levels starting in FY 2006, with completion by FY 2008.

# Management Processes

From 2006 to 2008, the MSFC CIO will begin transitioning from Center-centric IT security postures and capabilities to leveraging Agency-wide solutions. The MSFC CIO will integrate technology across the Center, bringing architectures into alignment with Agency standards. This will help to streamline security and information management tools, and provide a higher level of process automation.

Other MSFC CIO plans and activities supporting IT security and Organization Objective Two include:

- ▶ Enhancing the security posture for NASA, via implementing SRR69 Agency perimeter firewall infrastructure.
- ▶ Aligning the National Space Science and Technology Center (NSSTC) network with Agency and Center domain structure.
- ▶ Performing annual reviews of IT security, service continuity, contingency, and disaster recovery plans.
- ▶ Ensuring Center IT system certification and accreditation (C&A).

ata o

# Continuity of business and mission IT support are paramount.

MSFC CIO Initiatives include enhancing management processes that increase our ability to be a business and mission enabler instead of merely a technology provider.

- Providing required IT security training and certification opportunities.
- ► Tracking Plan of Actions and Milestones and determining IT security weaknesses.
- Defining a common process for applications security for application and web access depending on security level.

### **Trends**

In addition to those initiatives addressed above, there are a number of potential new IT security projects and technologies being considered for the next five years. These include:

- Unified desktop management, which enhances Center IT security posture by allowing insight into desktop computers on the MSFC domain to ensure security compliance
- ► Center for Internet Security (CIS) benchmarking, which allows security "templates" containing the appropriate level of internet security settings to be pushed to computers and applied to the operating system (OS)
- ▶ Intrusion Detection/Incident Response monitoring of all premium IP (PIP) services, which will provide the first line of defense to intrusion at the Centers
- Exploring the next generation of scanners for enhanced network security capabilities
- Installing sensors on the LAN, which will enable proactive safeguards against machine compromises.

The MSFC CIO is also identifying, examining, and looking to implement new IT security approaches and toolsets. Next generation IT security technologies, including enhanced forensics capabilities and biometrics, will be explored. In addition, the MSFC CIO looks at emerging IT risks with new communications and data transfer technologies, such as wireless technology including WiFi, Bluetooth®, and Cellular.

# ■ 4.2.2 Planned MSFC CIO Initiatives

**Develop/Modernize/Enhance (DME)** initiatives that support our second Organization Objective and the years in which they are planned are shown in the figure 4.2.2-1.

MSFC CIO Organization Objective 2: Ensure information technology resources and infrastructure are secure and accessible.

MSFC CIO Initiatives	Category	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
IT Security Center Phase II	OAIT	DME		S	S	
Common Badging and Access Control System (CBACS)	OAIT	DME		S	S	
Institute NASA-wide physical access control system via SmartCard technology	OAIT	DME		S	S	
Develop, implement, and ensure compliance with Agency and Center IT Security Policy	OAIT	DME		S	S	
Develop, Implement, and Monitor the MSFC IT Security Program	OAIT	DM	E		SS	
Implement Center IT Security incident response and investigation capability	OAIT	DM	E		SS	
Implement Center IT Security vulnerability identification and mitigation program	OAIT	DM	E		SS	
Intrusion Detection System Router Upgrade	OAIT	DM	E		SS	
Deploy and operate Patchlink patch management and reporting service at MSFC	OAIT		DME			SS
Enhance the security posture of MSFC	OAIT		DME			SS

Figure 4.2.2-1—MSFC CIO DME Initiatives to ensure IT resources and infrastructures are secure and accessible.

**Steady State (SS)** initiatives aligned with Organization Objective Two are shown in the Appendix D tables.

# ■ 4.3 MSFC CIO Organization Objective Three:

Deliver Innovative, Quality Products and Services

In order for our customers to achieve the Center's goals efficiently, we must deliver innovative, quality products and services that meet our customers' IT needs. We strive to provide services that make our customers better at what they do, allowing them to focus on the mission and not on the IT infrastructure and resources which they use. This helps Agency and Center Programs and Projects get the most out of their people's performance.

Table 4.3-1—MSFC CIO Implementation Actions and Performance Measures, FMOs, and examples of Planned Initiatives to deliver innovative, quality products and services.

MSFC Goal One—Superior Execution of Assigned Programs and Projects					
MSFC CIO Organization Objective Three—Deliver Innovative, Quality Products and Services					
MSFC CIO Implementation Actions	Intent of Forecasted Measurable Outcomes (FMO)	Examples of Planned MSFC CIO Initiatives			
Provide high quality, competitively priced, and readily available products and services	<ul> <li>On-time delivery</li> <li>Minimized lag time to install new seats</li> <li>Shorten delivery time for catalog orders</li> </ul>	<ul> <li>Web-based Documentum</li> <li>Employee Clearance System (ECS)</li> <li>MSFC Export Control Application (MECA)</li> </ul>			
Ensure offerings are consistent with guidelines and meet customer needs	<ul> <li>Completed customer experience assessment annually</li> <li>High customer satisfaction ratings</li> </ul>	<ul> <li>Propulsion, Structural Test Area, Science, and Space applications support</li> <li>NSSTC support</li> <li>NASA Web support</li> </ul>			
Respond to problems and customer concerns in a timely manner	<ul> <li>Quick turnaround time to complete moves/adds/ changes</li> <li>Fast Return to Service response</li> </ul>	<ul> <li>NASA Information Support Center (NISC)</li> <li>Outsourcing Desktop Initiative for NASA (ODIN)</li> </ul>			
Ensure accuracy, communication, and professionalism of support staff	► High customer satisfaction ratings	Help Desk			

# ■ 4.3.1 Highlights of Initiatives and Trends

MSFC CIO Initiatives in the following areas support our third Organization Objective—delivering innovative, quality products and services:

- Customer Support
- Critical Systems and Applications Support.

# **Customer Support**

The MSFC CIO is responsible for 24×7 monitoring and help desk coverage. The **NASA Information Support Center** (NISC), a 24×7 Tier I and Tier II call center that opens, addresses, and tracks approximately 923 trouble tickets per week. Its driving philosophy is to provide human interaction to each caller with a goal of first call resolution. In addition, the MSFC CIO provides 24×7 Desktop, LAN, and

e-mail help desk support through the **ODIN Help Desk**. The MSFC CIO has assured a high degree of integration between the ODIN and NISC help desks through automated trouble ticket handoffs and various Memoranda of Understanding (MOU). As high-touch customer support organizations, help call support is offered for:

- MSFC IT applications
- ► Agency-wide IT applications
- ► Integrated Enterprise Management Program (IEMP) Competency Center (IEMCC)
- ► NASA Data Center (NDC)
- ▶ ODIN Desktops
- Center-wide Wired and Wireless LANs
- Mid-range Servers
- ► E-mail
- NISN.

In addition to the NISC and ODIN Help Desks, the MSFC CIO provides monitoring and Tier I and Tier II help desk support for the Agency-wide network through the **Enterprise Network Management Center (ENMC)**. The ENMC utilizes the Remedy system to open trouble tickets and track resolution for all network issues. To ensure a high degree of integration and interoperability, this system is integrated with the NISC Remedy system. In addition to help desk support, the ENMC functions as a Tier II organization to address and resolve trouble tickets generated by the NISC. Finally, the ENMC manages all adds, changes, or moves affected the NASA network.

A key organization providing 24×7 IT Security monitoring and vulnerability identification for NASA's Standard IP (SIP) backbone is the **NISN Security Operations Center (NSOC)**. In addition to providing security monitoring, the NSOC staff troubleshoot security instances, assist IT Security managers with incident investigations, and determine whether security blocks need to be put in plane on the network. In the near-term, the NSOC is looking to extend its monitoring services for WAN Replacement to include the PIP backbone and telephone circuits.

As a part of the NASA Integrated Services Environment (NISE), the NISC will be implementing certain self-service functions for help desk callers, especially those requiring password resets and other identity management functions. Because these

# MSFC CIO provides enhanced levels of customer support through:

- NASA Information Support Center (NISC)
- Enterprise Network Management Center (ENMC)
- NISN Security Operations Center (NSOC)
- NASA Data Center (NDC)



functions will be self-directed, customers will be able to operate at their own pace and at a time that is convenient for them. However, in order to remain responsive to those customers preferring a human interface, options will always be available to perform this function through a help desk analyst. The full implementation of this capability is anticipated by 2009.

The MSFC help desk teams are also investigating technological innovations to enhance customer support. By 2007, the teams plan to install an enterprise system that will provide a single point of visibility to disparate Center-wide monitoring systems. This technology will provide a help desk analyst with the latest status for all systems and infrastructures across the Center.

As the Center transitions to VoIP, the MSFC help desk groups will be leveraging this technology to enhance the NASA customer's help desk experience. The NISC will be analyzing the feasibility of utilizing a tool whereby a system end user with an application, tool, or system administration issue would "click" on a help desk icon that immediately connects the PC and telephone to the NISC. The help desk analyst would be able to remotely connect to the end user's PC, see the problem real-time, and remain in constant communication with the customer. This capability would further the MSFC CIO goal of providing customers with convenient, uncomplicated, accurate, and timely support.

In the future, the MSFC CIO will consider new tools and techniques to improve the computing help structure through the utilization of more intuitive user interaction. The ODIN organization is re-engineering its ordering catalog to provide more user-friendly interface. By incorporating customer-focused consumer based designs, the ordering catalog will be more intuitive and more easily navigated..

The NASA Data Center (NDC) provides Sustaining Engineering Support for Agency-wide Administrative Systems (SESAAS). The NDC provides a central location, operation, and management of non-mission critical Agency infrastructure to include mainframes, midrange systems, and applications required to support the Agency's mission. As part of SESAAS, the MSFC CIO hosts and maintains Agency-wide administrative application software and documentation.

# **Critical Systems and Applications Support**

The MSFC CIO provides on-going product development and support for critical systems and applications for the Center and Agency. Our teams currently support every directorate at MSFC, while providing substantial resources for the engineering directorate.

The MSFC CIO enables the NASA mission through our continued support of:

- Propulsion, Structural Test Area, Science, and Space
- NSSTC
- ▶ Web presence of the NASA community.

The MSFC CIO will be implementing a web-based Documentum ™ solution to automate the directives review process. The current software supporting directives review is no longer supported by the vendor. The replacement solution will re-establish vendor support, and provide an enhanced electronic review process. Another initiative during FY 2006 is the implementation of the Employee Clearance System (ECS). This system will enhance the automated capability to clear employees leaving the Marshall Space Flight Center, automating and error-prone manual process and ensuring the removal of access permissions for those leaving the Center. Another enhancement being provided to the Center is the development of the MSFC Export Control Application (MECA). MECA will enable on-line maintenance for export control transactions.

# Propulsion, Structural Test Area, Science, and Space

The MSFC CIO provides support to develop and run data acquisition systems for propulsion and structural testing. We will continue to provide assistance converting raw data into engineering units and maintaining software for analysis. We assist with high-speed test recording, as well as performing calibration, maintenance, and other hardware support.

The MSFC CIO also provides support to the Space Shuttle Program. Our team provides state of the art launch film analysis capabilities in support of the Shuttle Return to Flight. This new solution provides enhanced image enlargement, freeze frames, and other capabilities recommended by the *Columbia* Accident Investigation Board (CAIB) Report.



The MSFC CIO supports a number of other mission areas, including:

- NASA's Exploration Systems Mission Directorate (ESMD) Integrated Collaborative Environment—training, help desk, and application administration
- *ISS* Environmental Control and Life Support System (ECLSS) development subsystems—Windows-based testing and archiving systems
- FD42 Mission Planning development systems
- Advanced Microwave Scanning Radiometer (AMSR-E) and Earth Science Information Partner (SIPS) data processing
- HOSC Payload Operations Integration Center (POIC) systems
- X-ray Calibration Facility (XRCF)—customer support including system administration, system loading and updating, and IT security
- Earth Planetary Science data servers, satellite data processing, and archives—hardware and software maintenance and IT support personnel
- Global Hydrology Research Center (GHRC), which provides both historical and current Earth science data, information, and products from satellite, airborne, and surface-based instruments
- Payload Data Library (PDL), which allows users access to data associated with their assigned payloads, as approved by NASA authorized personnel
- Lightning Imaging Sensor science, housekeeping, and ephemeris data, which are used worldwide by the lightning scientific community
- Flight Software Development system used to develop embedded flight software for various programs
- Antenna Range Data Collection and Analysis System (ARDCAS)
- Virtual Research Center (VRC), a web-based project management system that provides a central location for making project data available to geographically-dispersed teams
- Materials and Processes Technical Information System (MAPTIS), which serves all NASA Enterprises by capitalizing on information technologies to satisfy unique customer requirements
- High-resolution Digital Radiography (HRDR) system, which is connected to the NASA private network to transfer (FTP) digital x-ray images from UNIX systems
- Flash Computed Tomography (FlashCT) system, used to CT composites, ceramics, small metallic castings and components

- Science Directorate Publications Metrics Database (SDMD), used to enter and retrieve information regarding the professional and community activities of NASA and contract scientists
- Solar Ultraviolet Magnetograph Instrument Program
- EBNet Transition
- Enhanced Photo Optical Control Center (EPOCC)—provide a PIP quality
  of service level of 155 megabits per second (Mbps) with burst capability to
  200 Mbps from KSC to JSC and MSFC.

Additional activities for the scientific and engineering community include support for a variety of scientific instruments utilized in space. MSFC CIO support encompasses software and data processing for the following:

- Software support for the Low-energy Neutral Atoms (LENA) instrument on the Imager for Magnetopause-to-Aurora Global Exploration (IMAGE)
- Software development support to decode and graph other data from the IMAGE project
- Software support for three instruments on the Polar Spacecraft: Thermal Ion Dynamics Experiment (TIDE), Ultraviolet Imager (UVI), and Plasma Source Instrument (PSI)
- Solar Physics Support Software (SPSS) for the Vector Magnetogram Analysis Package (VMAP) and Quick VMAP (QVMAP)
- Lightning Mapping Array (LMA), which will consist of 12 measurement stations deployed over northern Alabama information is relayed to the NSSTC through a microwave communications link
- Software development support for the Gamma-Ray Large Area Space Telescope (GLAST).

# ► National Space Science and Technology Center (NSSTC)

The MSFC CIO will continue to support the NSSTC through infrastructure maintenance such as:

- Desktop Support
- Network support
- E-mail
- Telephones.



# Web Support

The MSFC CIO will continue to provide high quality web hosting, web development, content management, and system administration services to the NASA community. Examples of web sites and applications that will continue to be supported for the foreseeable future are:

- Ground Systems Department web site, home of the Tele-science Resource Kit (TReK) that ISS payloads scientists can use to control their payloads remotely
- Office of Biological and Physical Research Image Gallery web site
- Payloads 1 web server, which provides ISS information such as payload integration and operations data
- Science Directorate internal web site to provide NASA employees with current information on the Science Directorate
- NSSTC Personnel List Web Application, which allows the searching of the NSSTC personnel list by several options
- NSSTC public web site, which provides the public with current information about the NSSTC, including news releases and a calendar of events
- Space Product Development web site, which provides information regarding opportunities and contact names for the commercialization of space product development
- Glovebox Integrated Microgravity Isolation Technology (G-LIMIT) web site, which provides current information on the G-LIMIT system, its development and its use
- Biological Crystal Growth web site, which provides the public with current information on past, present, and future NASA crystal growth experiments
- Student Access to Space web site, which provides information on the program, as well as resources for students and teachers
- Earth Science web site, which provides information about Global Hydrology and Climate Center (GHCC) research
- Brazil Lightning Detection Network (BLDN) web site, which makes the current BLDN status and lightning activity available in near real-time to scientists
- Space Optics Manufacturing Technology web site.

# ■ 4.3.2 Planned MSFC CIO Initiatives

**Develop/Modernize/Enhance (DME)** initiatives that support our third Organization Objective and the years in which they are planned are shown in figure 4.3.2-1.

# **MSFC CIO Organization Objective 3:** Deliver innovative, quality products and services.

MSFC CIO Initiatives	Category	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Develop the Lightning Mapping Array (LMA), which will consist of 12 measurement stations deployed over northern Alabama. Information is relayed to the NSSTC through a microwave communications link.	PS	DME		S	S	
Transition Directives Review Process from Tango software to Documentum.	OAIT	DME		S	S	
Employee Clearance System (ECS)	OAIT	DME		S	S	
MSFC Export Control Application (MECA). Provide an on-line capability for maintaining export control transactions.	OAIT	DME		S	S	

Figure 4.3.2-1—MSFC CIO DME Initiatives to deliver innovative, quality products and services.

**Steady State (SS)** initiatives aligned with Organization Objective Three are shown in the Appendix D tables.

MSFC CIO initiatives deliver innovative, quality products and services to our customers and enable numerous Agency and Center objectives through:

- ► Assisting in Propulsion capability development (data analysis)
- ► Facilitating design, development and testing (test data conversion)
- ► Returning the Space Shuttle to flight (launch film analysis)
- ► Supporting the development of the Crew Launch Vehicle and Crew Exploration Vehicle and the IT needs of ESMD (Integrated Collaborative Environment)
- Assisting with International Space Station completion (development subsystem test and archiving; payload systems support)
- ► Facilitating Earth Science (data server maintenance)
- ► Supporting scientific instruments utilized in space (software and data processing for LENA, IMAGE, LMA, GLAST, among others)
- ▶ Distributing information to the public, within Projects, and for management and implementation of Programs (external and internal web hosting).

# 4.4 MSFC CIO Organization Objective Four:

Be the Leader in Delivering Agency IT Services

In order to help achieve the Center's goal of Superior Execution of Assigned Programs and Projects, we need to lead the delivery of IT services to the Agency. The MSFC CIO enables the execution of the Agency's mission by leveraging the common networking and data center needs of NASA Programs and Projects into Agency-wide services. The services, based on standardized and consolidated systems, allow the most effective use of available resources to help ensure the Agency's mission is affordable.

Table 4.4-1—MSFC CIO Implementation Actions and Performance Measures, FMOs, and examples of Planned Initiatives to be the leader in delivering Agency IT services.

MSFC Goal One—Superior Execution of Assigned Programs and Projects					
MSFC CIO Organization Objective Four—Be the Leader in Delivering Agency IT services.					
MSFC CIO Implementation Actions Intent of Forecasted Measurable Outcomes (FMO) Examples of Planned MSFC CIO Initia					
Deliver next generation WAN	<ul> <li>Executed Agency CSPA's per plan (cost, schedule, technical)</li> </ul>	<ul> <li>NASA Integrated Services Network (NISN) WAN backbone upgrade</li> <li>Routed Data Infrastructure Refresh (RDIR)</li> </ul>			
Implement standards-based systems and services for identify management, account management, e-authentication	► Implemented NASA Integrated Services Environ- ment (NISE)	► NISE ► CBACS			
Consolidate Agency IT infrastructure under NASA Data Center	► Increased NDC Revenue	<ul> <li>NDC Logical Partition (LPAR) Consolidation</li> <li>NDC Modified Cost Recovery Methodology</li> </ul>			

# ■ 4.4.1 Highlights of Initiatives and Trends

MSFC CIO Initiatives in the following areas support our fourth Organization Objective—be the leader in delivering Agency IT services:

- Networking
- ► Collaborative Conference Rooms
- ► Tools and Applications
- ▶ Business Systems and Institutional Support.



# Networking

The MSFC CIO's networking responsibility within NASA includes **NASA Integrated Services Network (NISN)**, which provides voice, video, data, and messaging services to Agency customers across wide area telecommunications networks, as well as networks that supports the **Russia WAN and LAN**.

# **Network Enhancements**

The MSFC CIO is currently in the process of enhancing the NASA WAN to increase capacity and robustness, and integrate mission and mission support capabilities. By early 2006, a complete technology refresh will be accomplished that will enable the WAN to support its growth in customer base.

An example of customer growth is the planned implementation of Common Organizational Messaging (COM), an Agency-wide effort which will provide a single messaging service, including e-mail, calendar, and meeting management, to the entire Agency. In the initial stage, COM will provide centralized e-mail capabilities for an estimated 15,000 SOMD users.

Network enhancements and potential new networking projects and technologies being considered for the next five years include:

- Implementing IP version 6 (IPv6)
- Implementing video streaming between the NASA Centers
- Upgrading mission network routers—this affects approximately
   70 routers at 20 sites
- Enhancing peering point locations at the WAN replacement
   Carrier Independent Facility, which will increase availability for a number of research, government, and corporate networks
- Implementing two diversely-routed fractional E1 circuits from JSC to the NASA hub in Moscow
- Improving Moscow hub efficiency by implementing a converged IP network, which replaces time division multiple access (TDMA) multiplexers with routers and switches, and capitalizing on the Russian synchronous optical network (SONET) transport.



WAN enhancement will increase the network capacity to 2.5 Gb, with further capacity increases to 10 Gb by 2007 and 100 Gb by 2010. This increase allowed us to explore other economic efficiencies, such as Voice and Video over IP.

In addition to the WAN enhancement, the NISN team will be completing a complete **routed data infrastructure refresh (RDIR)**. This activity, due to be implemented by Spring 2006, will refresh old network equipment that has reach "end of life" and is no longer serviceable by the supplier. The three year lease-to-own replacement infrastructure will enable the NISN team to continue maintenance and service to the network.

# NASA Collaborative Infrastructure Conference Rooms

Another major MSFC CIO Initiative involves refitting numerous Agency conference rooms to be compliant with the NASA Collaborative Infrastructure (NCI). By 2010, the MSFC CIO expects to have implemented a standardized conferencing architecture that interfaces with a common badging and access control system. Under this schema, conference rooms can be scheduled and configured according to permissions associated with employee position and responsibility. To date, the MSFC CIO has begun work to update and expand conferencing capabilities in facilities at MSFC, JSC, KSC, and NASA Headquarters.

# **Tools and Applications**

The NASA Computing and Communications System (NCCS) is an Agency-wide IT infrastructure that includes a secure intranet and information mission control center with the capability to provide software distribution, help desk services, performance management, and visibility into networks, desktops, servers, and applications end-to-end.

The NASA Integrated Services Environment (NISE) enables the transition to CBACS, and further promotes One NASA, by establishing an integrated IT infrastructure for central management of Civil Servant and contractor user identity and location information and access authorization to NASA resources. NISE requires the identification and validation of authoritative sources of each Center's employee data. The supporting team currently maintains the authoritative source of employees and contractors at MSFC. In addition, this team is exploring tools to provide a middle-ware solution to extract data from the CBACS and NISE for use in other MSFC applications, tools, and reports.



# **Business Systems and Institutional Support**

The MSFC CIO will continue to support the following Business Systems:

- ► Legacy Asset Management Systems
- ► NASA's Legacy Payroll and Personnel System
- ► NASA's Web-based Time and Attendance System (WebTADS)
- NASA's Web-based and Mainframe Procurement Systems
- ► NASA's Web-based and Client Server Learning Systems
- ► Technical support for DFRC business applications

The MSFC CIO will continue to provide on-going support for the implementation of critical institutional tools and systems. The majority of the Institutional implementation activity is in support of the **Integrated Enterprise Management Program (IEMP)**. However, substantial support continues around some non-IEMP initiatives such as HEMI, various e-Government initiatives, and other institutional initiatives.

IEMP implementation support will continue through the next five years. The MSFC CIO will continue to provide outstanding customer support with the IEMP Compentency Center (CC). We have consistently provided Agency-wide system end users with help desk support with timely trouble ticket resolution. The scope of this MSFC CIO support focuses on helping with data cleansing and conversion, training development and delivery, interface development, de-commissioning of legacy systems, data archival and data warehousing, reports development, system administration, account administration, and operational infrastructure support.

The MSFC CIO will continue to support future IEMP and non-IEMP institutional implementations over the next five years. These include:

- ► The e-Gov Learning Management System (LMS)
- ► The Integrated Asset Management (IAM) module
- ► The Contracts Management Module (CMM)
- ► The Agency Labor Distribution System (ALDS)
- ► The Project Management Information Improvement (PMI²)
- ► The e-Gov Recruitment One-Stop (ROS)
- ► The I-View Project, an enterprise portal
- ► The Federal Procurement Data System-Next Generation (FPDS-NG)
  Transition—Phase 1
- ▶ PDWS report development for the CMM



Core Capability Tool (CCT) to provide strategic Institutional infrastructure planning and management capabilities Computerized Maintenance and Management System (CMMS) Mobile, implemented in Center Operations - Facilities, which utilizes mobile technology (i.e., PDAs) for work order recording and tracking Program Management Council (PMC) workflow support, which will implement web-based workflow automation to support the PMC processes. In addition to those initiatives addressed above, there are a number of potential new projects and technologies being planned for the next five years. These include: Transitioning from Analog television to Digital Television (DTV), which includes integrating all of the NASA Centers with Headquarters via DTV and providing for desktop digital television to reduce transition costs by not replacing analog television sets Upgrading the Dedicated Mission Voice switches under the Mission Operations Voice Enhancement (MOVE) project—upgrades will be on-going from 2005 through 2010. NASA Data Center (NDC) Optimization and Pricing

The NDC is assessing cost savings initiatives through the consolidation of main-frame resources, the development of a modified cost recovery methodology, and by leveraging technology innovations.

# • Consolidation of NDC Mainframe Resources

An opportunity for cost savings will result as the NDC consolidates mainframe disk space, reducing the number of logical partitions (LPAR) from 16 to nine. The Agency will realize cost savings through reductions in associated support staff and Independent Software Vendors (ISV).

# Modified Cost Recovery Methodology

During the coming year, the NDC will conduct a review of cost categories and allocation percentages for central processing unit (CPU), disk, and tape rates. Based on an analysis of the results, an evaluation of alternative charge back models will be conducted. The NDC is currently developing a consumption based "cafeteria plan" model for their customer charge back structure. In an effort to be more cost competitive, and more responsive to customer budgets, the NDC team will be developing the following offerings:

- - Fee-for-Service Offering: allows each customer a choice in the level of service with associated cost structure. These services will be:
    - Internet Services—provide standard levels of service, customer service, and full web server at a competitive unit cost
    - Collaboration—available at three levels of functionality on a
      fee-for-service basis with a rate for additional storage beyond the
      standard amount included. This will lower the cost to individual
      customers by leveraging an existing infrastructure.
    - Print Services—available at two levels, standard and secure, with a page count on a fee-for-service basis. This will offer more flexibility, better accountability, and improved customer service.
    - Production Control—available at a per job rate after initial setup under fee-for-service. This will offer more flexibility, better accountability, and improved customer service.
    - Application Hosting—available at three server levels based on CPU hours and one Mainframe level on a fee-for-service based on resource utilization
    - Optical Data Storage—available on a per report published basis after an initial setup fee. Charges will migrate from indirect to direct.
       Only those customers using the service pay for the service.
    - Business Intelligence—available at three levels of web access and a
      per document published and maintained basis. A thick client is also
      available.
    - Application Development—available at an hourly rate. Current
      customers will continue to be provided the service at a cost recovery
      rate. New customers will be provided the service at a fee-for-service
      rate that will help the NDC become fully self-sufficient.

# - Per Use or Per Item Offering:

- Citrix®—available on a per user seat and an application hosting basis. This will lower the cost to individual customers by leveraging an existing infrastructure.
- Equipment Housing—available at a cubic foot rate which will
  provide a method to recover costs for equipment housed within the
  NDC.
- Disaster Recovery—available based on the level of recoverability and response time required.



Hourly rates for Database Management and Administration,
 Computer Resource Management, and Engineering Services.

Other cost savings opportunities for the MSFC CIO include:

- Software standardization—provides economies of scale (licenses, support, training, etc.)
- IP migration—reduces telecommunications costs, providing major cost savings.

# • Management and Technology Innovations

The MSFC CIO continues to investigate management and technology alternatives to improve delivery, reduce costs, and enhance service. NDC will consider other optimization initiatives that may last over the next four to five years. These include:

- Agency-wide server technology project management model: The implementation of this model will use project management best practices to ensure schedules are developed and managed, resources are managed to requirements and schedules, and project plans are developed for each new NDC initiative, identifying scope, schedule, resource requirement, customer need and drivers, and expected benefits. The benefit to customers will be projects that are more transparent to stakeholders, and better integration application developers and the NDC.
- NDC Mainframe Outsourcing: The NDC is investigating options to outsource the Data Center Mainframe Services in order to provide state of the art infrastructure with reduced cost to end users.

# ■ 4.4.2 Planned MSFC CIO Initiatives

**Develop/Modernize/Enhance (DME)** initiatives that support our fourth Organization Objective and the years in which they are planned are shown in figure 4.4.2-1.

**Steady State (SS)** initiatives aligned with Organization Objective Four are shown in the Appendix D tables.

#### MSFC CIO Organization Objective 4: Be the leader in delivering Agency information technology services.

MSFC CIO Initiatives	Category	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Transition NASA to the eGov Online Learning Center (eTraining/eLearning)	OAIT	DME	ME SS			
Analog to Digital Television Transition	OAIT	DME		S	S	
RDIR (Routed Data Infrastructure Refresh)	OAIT	DME		S	S	
NDC Logical Partition (LPAR) Consolidation	OAIT	DME		S		
Upgrade NISN WAN backbone infrastructure	OAIT	DM	DME SS			
Implement Contracts Management Module	OAIT	DM	DME SS			
Implement NASA Integrated Services Environment (NISE) initiatives	OAIT	DM	E		SS	
Project Management Information Improvements (PMI <sup>2</sup> )	OAIT		DME			SS
Federal Procurement Data System—Next Generation (FPDS-NG) Transition—Phase I	OAIT		DME			SS
Provide collaborative IP-based infrastructure for video teleconferencing as part of NASA Collaborative Infrastructure (NCI)	OAIT			DME		SS
Replace mission voice switches at multiple NASA Centers	MP/MP			D	OME	SS

Figure 4.4.2-1—MSFC CIO DME Initiatives to be the leader in delivering Agency IT services.

## ■ 4.5 MSFC CIO Organization Objective Five:

Balance and Optimize IT Investments, Development, and Standardization. (Review IT Architecture to ensure it does not become obsolete.)

To help achieve MSFC Organizational Management Excellence, we will use a standardized approach to ensure IT investments are balanced and optimized to support the Center and Agency. The IT investments we make must be aligned with the Agency's enterprise architecture. Furthermore, the MSFC IT Architecture will be regularly reviewed to ensure it does not become obsolete.

Table 4.5-1—MSFC CIO Implementation Actions and Performance Measures, FMOs, and examples of Planned Initiatives to balance and optimize IT Investments, development, and standardization.

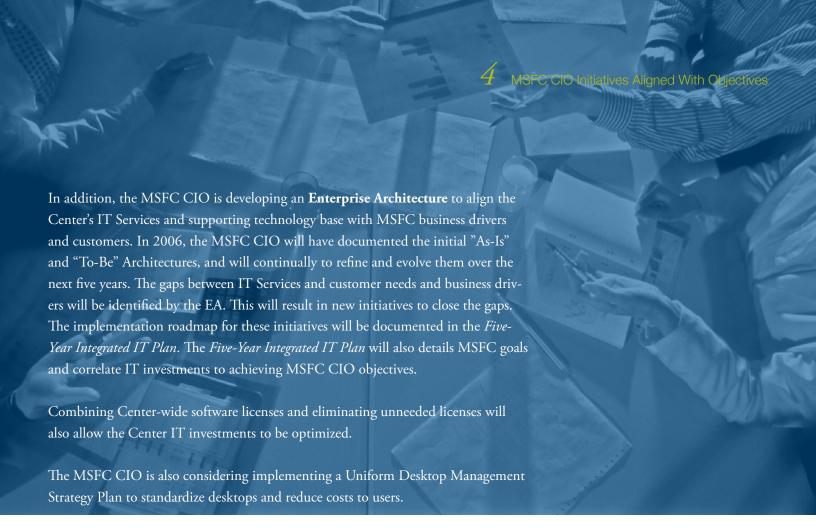
#### MSFC Goal Three—Organizational Management Excellence

MSFC CIO Organization Objective Five—Balance and Optimize IT Investments, Development, and Standardization. (Review IT Architecture to ensure it does not become obsolete.)									
MSFC CIO Implementation Actions Intent of Forecasted Measurable Outcomes (FMO) Examples of Planned MSFC CIO Initiatives									
Ensure MSFC EA is aligned with Agency/federal EA	<ul> <li>Completed MSFC EA As-Is Assessment</li> <li>Completed MSFC EA To-Be Assessment</li> </ul>	► Build MSFC EA to conform to OMB, GAO, NASA, and FEA standards							
Implement Uniform Desktop Manage- ment Across All Programs	► Implemented Uniform Desktop Management process at MSFC	► Uniform Desktop Management							
Manage IT through an Integrated IT Planning Framework process	► Delivered Five-Year Integrated IT Plan annually	► Integrated IT Planning							

#### ■ 4.5.1 Highlights of Initiatives and Trends

The MSFC CIO is developing an **Information Technology Management Information Initiative (ITMII)** tool to provide us with greater IT asset visibility and decision-making capability. When completed, the ITMII tool will provide business intelligence to the MSFC CIO such as asset utilization (or non-utilization) and trend analyses.

The ITMII tool currently contains an inventory of IT assets and provides acquisition visibility through its interface with the PCard system. By 2006, the ITMII tool will gain visibility to all UNITeS IT acquisitions. This visibility will be extended to Center-wide IT acquisitions by 2009.



#### ■ 4.5.2 Planned MSFC CIO Initiatives

**Develop/Modernize/Enhance (DME)** initiatives that support Organization Objective Five and the years in which they are planned are shown in the following figure 4.5.2-1.

#### MSFC CIO Organization Objective 5: Balance and optimize IT investments, development, and standardization. (Review IT architecture to ensure it does not become obsolete.)

MSFC CIO Initiatives	Category	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Build MSFC Enterprise Architecture to conform to OMB, DAO, NASA, and FEA standards	OAIT	DME		S	S	
Develop the IT Management Information Initiative (ITMII) tool	OAIT	DIV	IE .		SS	
Tri-annual refresh of NDC infrastructure to ensure the most effective and efficient operation	OAIT				DME	

Figure 4.5.2-1—MSFC CIO DME Initiatives to balance and optimize IT investments, development, standardization.

**Steady State (SS)** initiatives aligned with Organization Objective Five are shown in the Appendix D tables.

# ■ 4.6 MSFC CIO Organization Objective Six: Lead the Technical and Business Management of IT Resources at MSFC

To be responsive to federal legislation, policy, and guidelines, and the Agency's new focus, it is imperative that we lead the technical and business management of IT resources at MSFC. With multiple requirements vying for limited resources, we will manage our resources from a global organization perspective; ensuring resources are applied in a prioritized manner, based on formal, standardized processes. Our IT investments will be consistent with and most relevant in furthering Center and Agency goals. In order for us to prepare for the technical challenges that lie ahead, we must develop core competencies of our people to shape the IT workforce of the future.

Table 4.6-1—MSFC CIO Implementation Actions and Performance Measures, FMOs, and examples of Planned Initiatives to lead the technical and business management of IT resources at MSFC.

	MSFC Goal Three—Organizational Management								
MSFC CIO Organization Objective Six—Lead the Technical and Business Management of IT Resources at MSFC.									
MSFC CIO Implementation Actions	Intent of Forecasted Measurable Outcomes (FMO)	Examples of Planned MSFC CIO Initiatives							
Align resources with Center/Agency missions, goals, and objectives	<ul> <li>Recovered cost for Agency work</li> <li>Completed annual review of service portfolio</li> </ul>	► Process and Capabilities Streamlining							
Match investments to missio capability, risk, and performance	<ul> <li>Utilize CPIC process for Center IT projects</li> <li>Demonstrate return on investment (ROI) for IT projects</li> </ul>	► Software Process Improvement Initiative							
Assess business value of next genera- tion emerging technologies	► Reduced costs	► CPIC  ► IT Evaluation Program							
Provide systems to facilitate information sharing among organizations	Cost savings								

#### ■ 4.6.1 Highlights of Initiatives and Trends

MSFC CIO Initiatives in enhanced processes support Organization Objective Six —lead the technical and business management of IT resources at MSFC.

As discussed in Sections 2 and 3, the MSFC CIO is instituting the IITPF comprised of VOC, IT Governance, CPIC, EA, and ITEP. The IITPF and its components enhance the business management of IT resources. In addition, the MSFC CIO is exploring other management processes for optimization, as described below.

#### **Software Process Improvement Initiative**

The MSFC CIO will continue to enhance its software development and implementation processes through utilization of NPR7150.2. The Software Process Improvement Initiative will establish and document, through the Software Development Plan (SDP), a standard Project Management process based on Software Engineering Institute standards and corporate best practices. As this initiative is implemented during 2005, customers can expect to see improved responsiveness and cost savings.

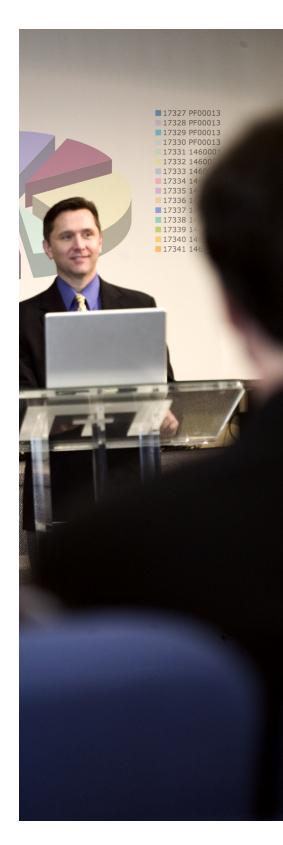
In order to achieve additional efficiencies, the MSFC CIO software development support will establish an architecture that standardizes tools, development languages, and databases. As an example, a reduction is planned in the number of development suites from about 50 to around 10. Although the architecture will be established in 2005, full implementation will be dependent on the decommissioning of existing production systems and environments that do not fit within the architecture.

#### **Process and Capabilities Streamlining**

Another current MSFC CIO Initiative is the potential optimization of business and technical processes through the realignment of workflow to core staff competencies. Time-intensive business processes that could be consolidated and executed by a small business management group are being identified. An example of these time-intensive processes are procurement and logistics. As staff with core technical competencies are aligned with technical workflow, and business staff focuses on business processes, customers could expect to see greater cost efficiencies while management could realize a better allocation of resources and higher accuracy.

#### ■ 4.6.2 Planned MSFC CIO Initiatives

**Develop/Modernize/Enhance (DME)** initiatives that support Organization Objective Six and the years in which they are planned are shown in figure 4.6.2-1.



#### MSFC CIO Organization Objective 6: Lead the technical and business management of IT resources at MSFC

MSFC CIO Initiatives	Category	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
MAF ET Product Manager Migration	PS	DME		\$	S	
Develop meaningful and actionable IDPs for all employees; develop and IT mentor program and provide Center career development information to all employees	OAIT		DI	ME		SS
Eliminate NDC operational risks due to single points of failure and maximize human capital	OAIT		DI	VIE		SS

Figure 4.6.2-1—MSFC CIO DME Initiatives to lead the technical and business management of IT resources at MSFC.

**Steady State (SS)** initiatives aligned with Organization Objective Six are shown in the Appendix D tables.

MSFC CIO Initiatives enhance processes that enable us to lead the technical and business management of IT resources in support of Agency and Center objectives by:

- Prioritizing investment decisions (Voice of the Customer, Enterprise Architecture, IT Capital Planning, and Investment Control processes).
- Making the mission affordable and responding to customer budgets and available resources (service optimization and pricing).
- Applying rigor in business practices (integrated IT management process, software process improvement initiative).

# **5** Closing

#### **Enabling the Mission**

As the Agency faces new opportunities and challenges, the MSFC CIO will continue to enable their efforts by supporting customers' information technology and communications needs. We will provide readily available and secure mission critical systems and services. Our services will enable the collaboration necessary to facilitate partnerships, allow the sharing of data and information necessary to advance scientific and technological capabilities of the nation, and provide the infrastructure necessary to distribute educational opportunities to the public.

#### A Customer-Focused Strategy

The services the MSFC CIO provides will be customer-focused, high quality, and competitively-priced. Over the next five years, we plan to utilize an IITPF as a means by which to apply additional rigor and analysis required for major IT investments and associated funding. This framework will also provide standardized and rationalized decision-making processes, and fully enable the Center to fulfill its essential role in accomplishing the Agency's mission. This, in part, will be enabled by the way in which we prioritize IT investment decisions based on mission capability, risk, performance, and available resources.

Customer insights drive our strategy. The MSFC CIO continues to refine IT management through a disciplined methodology to ensure investments are strategically leveraged to support the Center and Agency. The five components of the IITPF work together, influencing each other and overall IT planning, allowing better IT investment decisions. A phased approach allows us to develop, implement, utilize, and refine the IITPF so that we can achieve customer-centric, strategic IT management.

By leveraging the Voice of the Customer and analyzing customer needs, the MSFC CIO expects the following results:

- Improved customer experiences
  - Changes to infrastructure and process
- Lower costs
- ▶ Higher customer satisfaction.

As the EA matures over the coming year, MSFC CIO Service Owners will continue to gain insight into their customer's strategic goals, objective, and future direction. The implementation of the ITEP and TE process provides a single-point focus to effectively coordinate evaluation of IT across the Center. It provides a valuable resource for obtaining the Voice of the Customer and provides a consistent

#### **Enabling the Mission through:**

- A customer focused strategy
- Integrated IT Planning Framework
- Goal aligned inititatives
- · Prioritized investment decisions
- Measured performance.

Our journey will be in concert with the journey of our customers as NASA executes the Vision for Space Exploration.

methodology to identify potential technologies that are architecturally compliant, ready for insertion into the existing infrastructure, and effectively managed for risk and cost through incorporation of classic systems engineering methodologies.

#### Now and Beyond

The MSFC CIO's IT Initiatives align to the Center's goals and NASA's mission. Continuity of business and mission IT support are paramount. Enhanced processes increase our ability to be a business and mission enabler instead of merely a technology provider and enable us to lead the technical and business management of IT resources in support of Agency and Center goals.

The MSFC CIO envisions the future bringing evolutionary and revolutionary technologies that will further increase the ability of our customers to achieve NASA's mission. Emerging technologies will allow anytime, anywhere access to information. Future collaboration systems will promote enhanced methods of teamwork and cooperation without geographic bounds. Multi-level IT Security tools will further enable international partnerships while still protecting vital, export-restricted National information. And nanotechnology along with other technology advances, will allow an unparalleled level of miniaturization in computing and communications devices.

The MSFC CIO will leverage these innovative technologies on the horizon to benefit our continued development of the IT infrastructure that supports human and robotic exploration, international and commercial partnerships, and Earth science.

- We support programs and projects that are executing NASA's mission, Return to Flight, *International Space Station* completion, Crew Launch Vehicle development, and propulsion capability development.
- Our services enable the collaboration necessary to facilitate partnerships, the sharing of data and information necessary to advance scientific and technological capabilities of the nation, and the infrastructure to distribute educational opportunities to the public.
- IT supports the communications and IT needs of ESMD and other customers.
- We support efficient communication through the evaluation, integration, and operations of new technologies.
- Our services enable the communications essential to management and implementation of each Program.
- IT infrastructure distributes information for Projects and to the public.
- · We work in partnership with organizations and programs to provide the IT tools to facilitate design, development, and testing.
- We prioritize investment decisions based on the mission and available resources.

Our services help realize NASA mission success.



#### ■ Appendix A—References and Source Documents

#### References

- <sup>1</sup> NPD 1000.0, NASA Strategic Management and Governance Handbook; August 2005.
- NASA Information Technology Capital Planning and Investment Control Process; September 2004; With approval by Patricia L. Dunnington, NASA Chief Information Officer.
- <sup>3</sup> Federal Enterprise Architecture Framework; Version 1.1; September 1999.

#### **Source Documents**

Marshall Space Flight Center 2004 Implementation Plan.

Marshall Space Flight Center Enterprise Architecture Review Guidance Document; Draft; March 2005.

MSFC CIO Information Technology Master Plan 2005.

NASA Enterprise Architecture Volume 1: Strategies and Overview; Version 4.0; September 30, 2005.

NASA Exploration Systems Interim Strategy; August 2004.

NASA Information Resource Management Strategic Plan; 2004.

NPD 1000.0, NASA Strategic Management and Governance Handbook; August 2005.

The New Age of Exploration: NASA's Direction for 2005 and Beyond; February 2005.

The President's Management Agenda; Fiscal Year 2002.

The Vision for Space Exploration; February 2004.

# ■ Appendix B—Acronym List

ALDS	Agency Labor Distribution System	CLACT	C D . I A . C . T1
AMSR-E	Advanced Microwave Scanning Radiometer—	GLAST	Gamma-Ray Large Area Space Telescope
THVISICE	Earth	G-LIMIT	Glovebox Integrated Microgravity Isolation
ARC	Ames Research Center	COTS	Technology
ARDCAS	Antenna Range Data Collection and Analysis	GOTS GRC	government off-the-shelf Glenn Research Center
71100 0710	System		
BLDN	Brazil Lightning Detection Network	HEMI	Headquarters Electronic Messaging Initiative
BRM	Business Reference Model	HOSC	Huntsville Operations Support Center
C&A	certification and accreditation	HQ	NASA Headquarters
CAIB	Columbia Accident Investigation Board	HRDR Iam	High-resolution Digital Radiography
CBACS	Common Badging and Access Control System	IDEA	Integrated Asset Management  ISS Downlink Enhancement Architecture
CCT	Core Capability Tool	IEMCC	
CFO	Chief Financial Officer	IEMCC	Integrated Enterprise Management Competency Center
CIO	Chief Information Officer	IEMP	
CLV	Crew Launch Vehicle	IFM	Integrated Enterprise Management Program Integrated Financial Management
CMM	Contracts Management Module	IITP	
COM	Common Organizational Messaging	11 1 1	MSFC CIO Five-Year Integrated Information
CMMS	Computerized Maintenance and Management	IITPF	Technology Plan Integrated Information Technology Planning
CIVIIVIO	System System	штт	Integrated Information Technology Planning Framework
COOP	Continuity of Operations Planning	IMAGE	
CPIC	Capital Planning and Investment Control	IMAGE	Imager for Magnetopause-to-Aurora Global
CPU	central processing unit	IMSB	Exploration Integrated Management System Roard
CRM	Customer Relationship Management	IP	Integrated Management System Board
CSO	Computer Security Official	IPv6	Internet protocol Implementing IP version 6
CT	computerized tomography	ISS	International Space Station
DFRC	Dryden Flight Research Center	ISV	independent software vendors
DME	Develop/Modernize/Enhance	IT	Information Technology
DR	Disaster Recovery	ITC	CIO Information Technology Council
DTV	digital television	ITEDB	Information Technology Evaluation Database
EA	Enterprise Architecture	ITEDB	Information Technology Evaluation Program
EBNet	EOS Backbone Network	ITFG	<u>-</u>
ECLSS	Environmental Control and Life Support	ITMII	Information Technology Focus Group Information Technology Management
ECS	Employee Clearance System	1110111	Information Initiative
ENMC	Enterprise Network Management Center	ITSC	Information Technology Security Center
EOS	Earth Observing System	ITSM	IT Security Manager
EPOCC	Enhanced Photo Optical Control Center	JSC	Johnson Space Center
ESMD	Exploration Systems Mission Directorate	KSC	Kennedy Space Center
FEA	Federal Enterprise Architecture	LAN	local-area network
FEAF	Federal Enterprise Architecture Framework	LARC	Langley Research Center
FlashCT	Flash Computed Tomography	LENA	Low-energy Neutral Atoms
FMO	Forecasted Measurable Outcomes	LMA	Lightning Mapping Array
FPDS-NG	Federal Procurement Data System-Next	LMS	Learning Management System
	Generation	LOB	Lines of Business
FTP	file transfer protocol	LPAR	logical partitioning
FY	fiscal year	MAPTIS	Materials and Processes Technical Information
Gb	gigabit	1,111 110	System
GHRC	Global Hydrology Research Center	Mb	megabit
	,	1110	megapit

MECA	MSFC Export Control Applications	SOMD	Space Operations Mission Directorate
MOU	Memorandum of Understanding	SONET	synchronous optical network
MP/MP	Multi-Program/Multi-Project	SPC	Strategic Planning Council
MSFC	Marshall Space Flight Center	SPSS	Solar Physics Support Software
NAMS	NASA Acquisition Management System	SRM	Service Reference Model
NASA	National Aeronautics and Space Administration	SS	Steady State
NCARS	NASA Cyber Attack Response System	SSC	Stennis Space Center System
NCCS	NASA Computing and Communications	TDMA	time division multiplexed access
	System	TE	Technology Evaluation
NCI	NASA Collaborative Infrastructure	TIDE	Thermal Ion Dynamics Experiment
NDC	NASA Data Center	TMRA	Technology Management Reform Act
NESC	NASA Engineering Safety Center	TReK	Tele-science Resource Kit
NISC	NASA Information Support Center	TRM	Technical Reference Model
NISE	NASA Integrated Services Environment	UNITeS	Unified NASA IT Services
NISN	NASA Information Services Network	UVI	Ultraviolet Imager
NPR	NASA Procedural Requirement	ViIP	Video over Internet protocol
NSOC	NISN Security Operations Center	ViTS	Video Teleconferencing Service
NSSTC	National Space Science and Technology Center	VMAP	Vector Magnetogram Analysis Package
OAIT	Office Automation, IT Infrastructure, and	VOC	Voice of the Customer
0/11/1	Telecommunications	VoIP	Voice of the Customer  Voice over Internet protocol
ODIN	Outsourcing Desktop Initiative for NASA	VRC	Virtual Research Center
OMB	Office of Management and Budget	WAN	wide-area network
PC	personal computer	WebTADS	Web-based Time and Attendance System
PDA	personal digital assistant	WiFi	wireless fidelity
PDL		XRCF	•
PDWS	Payload Data Library	ARCF	X-ray Calibration Facility
PIP	Procurement Data Wharehouse System Premium Internet Protocol		
PM12	Project Management Information Improvement		
PMC	Program Management Committee		
PMO	Project Management Office		
POIC	Payload Operations Integration Center		
POP	Program Operating Plan		
PS	Program Specific/Unique IT		
PSI	Plasma Source Instrument		
QVMAP	Quick Vector Magnetogram Analysis Package		
RDIR	routed data infrastructure refresh		
RLEP	Robotic Lunar Exploration Program		
ROS	Recruitment One-Stop		
SDMD	Science Directorate Publications Metrics		
000	Database		
SDP	Software Development Plan		
SESAAS	Sustaining Engineering Support for Agency-		
O.T.D.	wide Administrative Systems		
SIP	Standard Internet Protocol		
SIPS	Science Information Partner		
SLA	Service Level Agreement		
CATIN	1: ·		

SMD

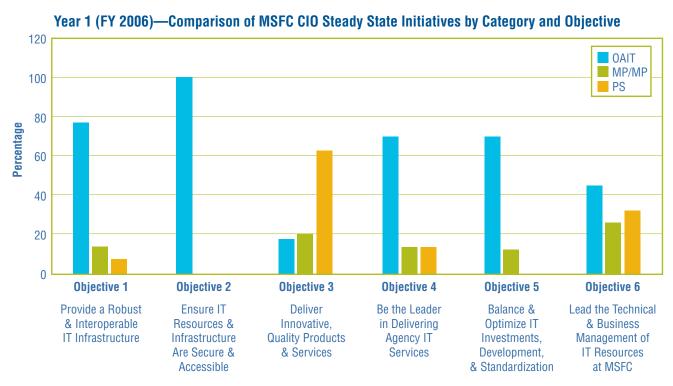
Science Mission Directorate

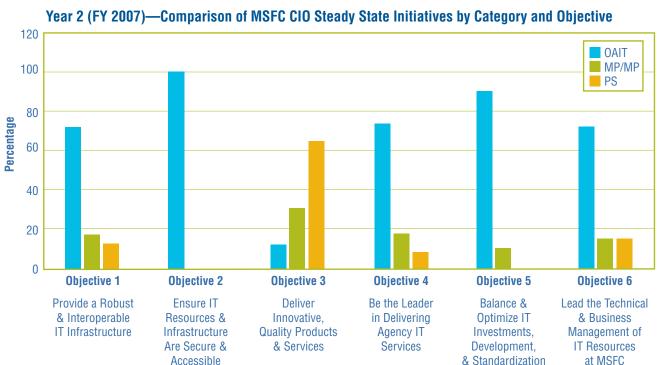
# ■ Appendix C—MSFC CIO Organization Chart and Points of Contact

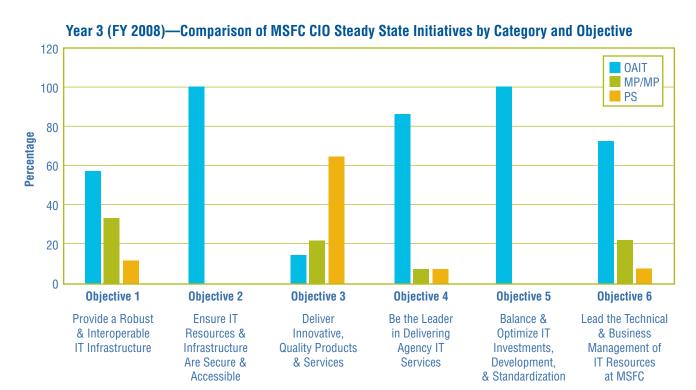
The current MSFC Office of the Chief Information Officer organizational chart and points of contact may be viewed at  $\frac{\text{http://cio.msfc.nasa.gov}}{\text{otherwise}}$ .

#### ■ Appendix D—MSFC CIO Steady State Initiatives

Appendix D contains the current view of MSFC CIO Steady State (SS) Initiatives aligned with the primary Organization Objective they support. The tables identify the categorization of each initiative based on the Agency CIO definitions for Office Automation, IT Infrastructure, and Telecommunications (OAIT), Multi-Program/Project IT (MP/MP), and Program Unique IT (PS). The graphs in the beginning of Appendix D compare MSFC CIO SS Initiatives by category and objective.







Year 4 & 5 (FY 2009-10)—Comparison of MSFC CIO Steady State Initiatives by Category and Objective 120 OAIT MP/MP 100 PS 80 Percentage 60 40 20 0 Objective 4 Objective 1 Objective 2 Objective 3 **Objective 5** Objective 6 Provide a Robust **Ensure IT** Deliver Be the Leader Balance & Lead the Technical & Interoperable Resources & Innovative, in Delivering Optimize IT & Business IT Infrastructure **Quality Products** Management of Infrastructure Agency IT Investments, Are Secure & & Services Development, IT Resources Services Accessible & Standardization at MSFC

Year 1: FY 2006							it, IT	
(10/01/05–09/30/06)			MSFC CIO Objective 1 Provide a robust & interoperable IT infrastructure	MSFC CIO Objective 2 Ensure IT resources & infrastructure are secure & accessible	MSFC CIO Objective 3 Deliver innovative, quality products & services	MSFC CIO Objective 4 Be the leader in delivering Agency IT services	MSFC CIO Objective 5 Balance & optimize IT investments, development, standardization. (Review IT architecture to ensure it does not become obsolete.)	MSFC CIO Objective 6 Lead the technical & business management of IT resources at MSFC
MSFC CIO Initiatives	Category	State	MSF Prov inter infra	MSF Enst infra & ac	MSF Deliv prod	MSF Be tl Agel	MSF Bala inve stan arch does	MSF Leac busi of IT
Development of a Mobile Technology policy.	OAIT	SS	✓					
Provide WebEx service.	OAIT	SS	✓					
Design, develop, & implement a system to provide streaming video content to the user's desktop.	OAIT	SS	✓					
Provide HOSC Internet Voice Distribution Systems (IVoIDS) to <i>ISS</i> Payload Operations support personnel.	PS	SS	✓					
Implement fast-Gigabit Ethernet HOSC ISS Downlink Enhancement Architecture (IDEA).	PS	SS	✓					
Expand deployment of Mobile Technology capabilities at MSFC.	OAIT	SS	✓					
Operate & maintain secure voice, data, & video communications services.	OAIT	SS	✓					
Support Advanced Engineering Environment (AEE) Infrastucture Team.	MP/MP	SS	✓					
Provide NACC rate options for variable billing to Centers.	OAIT	SS	✓					
Research Data Center Lab, to provide the capability to perform isolated product & equipment V&V.	MP/MP	SS	✓					
Determine needed upgrades for the Marshall LAN.	OAIT	SS	✓					
Develop best practices & processes for Software.	OAIT	SS	✓					
Engineering Process Group (SEPG) development & maintenance.	OAIT	SS	✓					
Explore ultra-computer capabilities for use at MSFC.	OAIT	SS	✓					
Integrate existing knowledge management systems across MSFC; repository of information to be easily accessed & searched by employees.	OAIT	SS	<b>~</b>					
Common Badge Access Control (CBACS) & Smart Card.	OAIT	SS		✓				
Implement Fail-over Database Capability for NASA Cyber Attack Response System (NCARS).	OAIT	SS		✓				
Enhance the security posture for NASA, via implementing SRR69 Agency perimeter firewall infrastructure, aligning NSSTC network with Agency & Center domain structure, annual review of IT security, service continuity, contingency, & disaster recovery plan.	OAIT	SS		<b>√</b>				
Ensure Center IT System Certification & Accreditation.	OAIT	SS		✓				
Provide required IT Security Training & Certification opportunities.	OAIT	SS		✓				
Provide Plan Of Actions & Milestones (POA&M) tracking & reporting of IT Security Weaknesses.	OAIT	SS		✓				
Define a common process for applications security for application/web access depending on security level.	OAIT	SS		✓				
Support Telescience Resource Kit (TReK) systems, used for the development of TReK software deployed to ISS Payload teams around the world via the TReK Web site.	PS	SS			<b>√</b>			
Support the Global Hydrology Research Center (GHRC), which provides both historical & current Earth science data, information, & products from satellite, airborne, & surface-based instruments.	MP/MP	SS			<b>√</b>			
Provide hardware & software maintenance & IT support personnel for Earth Planetary Science data servers, satellite data processing, & archives.	MP/MP	SS			<b>√</b>			
Office of Biological & Physical Research Image Gallery Web Site.	PS	SS			✓			

Year 1: FY 2006 (continued)						_	+; ⊨ (;	
(10/01/05–09/30/06)			MSFC CIO Objective 1 Provide a robust & interoperable IT infrastructure	MSFC CIO Objective 2 Ensure IT resources & infrastructure are secure & accessible	MSFC CIO Objective 3 Deliver innovative, quality products & services	MSFC CIO Objective 4 Be the leader in delivering Agency IT services	MSFC CIO Objective 5 Balance & optimize IT investments, development, standardization. (Review IT architecture to ensure it does not become obsolete.)	MSFC CIO Objective 6 Lead the technical & business management of IT resources at MSFC
MSFC CIO Initiatives	Category	State	MSF Provi inter infras	MSFI Ensu infras & aci	MSF Deliv prod	MSF Be th Agen	MSF Balar inves stand archi does	MSF Lead busir of IT
Maintain Payloads 1 Web server, that provides <i>ISS</i> information, i.e., payload integration & operations data.	PS	SS			✓			
Maintain the Payload Data Library (PDL), that allows users access to data associated with their assigned payloads, as approved by NASA authorized personnel.	MP/MP	SS			<b>√</b>			
Maintain the Telescience Support Center (TSC), that provides user connectivity to the Payload Operations and Integration Center (POIC) Data, Voice, and Video Systems.	MP/MP	SS			<b>√</b>			
Provide customer support for X-ray Calibration Facility (XRCF), including system administration, system loading and updating, and IT security.	PS	SS			<b>√</b>			
Advanced Microwave Scanning Radiometer (AMSR-E) and Earth Science Information Partner (SIPS) Data Processing.	PS	SS			<b>√</b>			
Maintain FD42 Mission Planning development systems.	MP/MP	SS			✓			
Provide NSSTC with IT infrastructure & customer support.	OAIT	SS			<b>√</b>			
Provide Windows-based testing and archiving systems for the ECLSS Development subsystems in support <i>ISS</i> .	PS	SS			<b>✓</b>			
Provide hosting to the Ground Systems Department Web Site, home of the Telescience Resource Kit (TReK) that <i>ISS</i> payloads scientists can use to control their payloads remotely.	PS	SS			<b>✓</b>			
Support Huntsville Operations Support Center (HOSC) Payload Operations Integration Center (POIC) systems.	MP/MP	SS			<b>√</b>			
Perform software development, digital signal processing, and monitoring of audio labs systems.	MP/MP	SS			✓			
Manage Lightning Imaging Sensor data, including two types of science, housekeeping, and ephemeris data daily. The data are used worldwide by the lightning scientific community.	MP/MP	SS			<b>√</b>			
Support Integrated Engineering System (IES), the primary CAD/CAM/CAE system at MSFC.	PS	SS			<b>√</b>			
Maintain Optical Plume Anomaly Detection Lab (OPAD) system used to analyze plumes that occur during mission specific occurrence.	PS	SS			<b>√</b>			
Operate SSME Hardware Simulation Laboratory, which supports flight hardware and software verification in support of the SSME.	PS	SS			<b>√</b>			
Operate Controller Software Lab (CSL), the mirrored Site of the HSL. The lab is located in Research Park at the Boeing facility.	PS	SS			<b>√</b>			
Support Flight Software Development system used to develop embedded flight software for various programs.	MP/MP	SS			<b>√</b>			

			 - N			
Maintain Payloads 1 Web server, that provides <i>ISS</i> information, i.e., payload integration & operations data.	PS	SS		<b>√</b>		
Maintain the Payload Data Library (PDL), that allows users access to data associated with their assigned payloads, as approved by NASA authorized personnel.	MP/MP	SS		✓		
Maintain the Telescience Support Center (TSC), that provides user connectivity to the Payload Operations and Integration Center (POIC) Data, Voice, and Video Systems.	MP/MP	SS		√		
Provide customer support for X-ray Calibration Facility (XRCF), including system administration, system loading and updating, and IT security.	PS	SS		<b>✓</b>		
Advanced Microwave Scanning Radiometer (AMSR-E) and Earth Science Information Partner (SIPS) Data Processing.	PS	SS		<b>✓</b>		
Maintain FD42 Mission Planning development systems.	MP/MP	SS		✓		
Provide NSSTC with IT infrastructure & customer support.	OAIT	SS		<b>√</b>		
Provide Windows-based testing and archiving systems for the ECLSS Development subsystems in support <i>ISS</i> .	PS	SS		<b>√</b>		
Provide hosting to the Ground Systems Department Web Site, home of the Telescience Resource Kit (TReK) that <i>ISS</i> payloads scientists can use to control their payloads remotely.	PS	SS		✓		
Support Huntsville Operations Support Center (HOSC) Payload Operations Integration Center (POIC) systems.	MP/MP	SS		✓		
Perform software development, digital signal processing, and monitoring of audio labs systems.	MP/MP	SS		<b>√</b>		
Manage Lightning Imaging Sensor data, including two types of science, housekeeping, and ephemeris data daily. The data are used worldwide by the lightning scientific community.	MP/MP	SS		✓		
Support Integrated Engineering System (IES), the primary CAD/CAM/CAE system at MSFC.	PS	SS		<b>√</b>		
Maintain Optical Plume Anomaly Detection Lab (OPAD) system used to analyze plumes that occur during mission specific occurrence.	PS	SS		<b>√</b>		
Operate SSME Hardware Simulation Laboratory, which supports flight hardware and software verification in support of the SSME.	PS	SS		✓		
Operate Controller Software Lab (CSL), the mirrored Site of the HSL. The lab is located in Research Park at the Boeing facility.	PS	SS		✓		
Support Flight Software Development system used to develop embedded flight software for various programs.	MP/MP	SS		✓		
Support Antenna Range Data Collection and Analysis System (ARDCAS).	PS	SS		<b>√</b>		
Support Radio Frequency Lab system used to develop radio frequency simulations and analyze the results.	PS	SS		✓		
Maintain the Contact Dynamic Simulation Lab and the Flight Robotics Lab (FRL).	PS	SS		✓		
Maintain the Avionics System Testbed (MAST).	PS	SS		✓		
Support Ascent Imagery analysis of Shuttle elements.	PS	SS		✓		
Support Collaborative engineering design, analysis and visualization.	PS	SS		<b>√</b>		

<b>Year 1: FY 2006</b> (continued) (10/01/05–09/30/06)			MSFC CIO Objective 1 Provide a robust & interoperable IT infrastructure	MSFC CIO Objective 2 Ensure IT resources & infrastructure are secure & accessible	MSFC CIO Objective 3 Deliver innovative, quality products & services	MSFC CIO Objective 4 Be the leader in delivering Agency IT services	MSFC CIO Objective 5 Balance & optimize IT investments, development, standardization. (Review IT architecture to ensure it does not become obsolete.)	MSFC CIO Objective 6 Lead the technical & business management of IT resources at MSFC
MSFC CIO Initiatives	Category	State	MSF Prov inter infra	MSF Ensu infra	MSF Deliv prod	MSF Be th Agen	MSF Balar inves stand archi does	MSF Lead busir of IT
Support the Virtual Research Center (VRC), a Web-based project management system that provides a central location for making project data available to geographically dispersed teams.	MP/MP	SS			<b>√</b>			
Maintain High-resolution Digital Radiography (HRDR) system, which is connected to the NASA private network to FTP digital x-ray images from UNIX systems.	PS	SS			<b>√</b>			
Support the Flash Computed Tomography (FlashCT) system, used to CT composites, ceramics, small metallic castings and components.	PS	SS			✓			
Support Collaborative Engineering Center, a facility for advanced visualization and multidiscipline engineering analysis.	PS	SS			✓			
Manage Ground Systems Department Web-deployed databases, where customer survey data is collected for HOSC.	PS	SS			✓			
Participate in Incident Reporting Information System (IRIS) User Group, and perform MSFC administrative functions and interfaces as necessary.	PS	SS			<b>√</b>			
Support Science Directorate Internal Web site to provide NASA employees with current information on the Science Directorate.	MP/MP	SS			<b>√</b>			
Maintain Science Directorate Science Communication Web site to help the public understand how exciting NASA research is and help NASA scientists fulfill their outreach responsibilities.	MP/MP	SS			<b>√</b>			
Maintain the Science Directorate Publications Metrics Database (SDMD), used to enter and retrieve information regarding the professional and community activities of NASA and contract scientists.	MP/MP	SS			<b>√</b>			
Maintain NSSTC Personnel List Web Application, which allows the searching of the NSSTC personnel list by several options.	OAIT	SS			<b>√</b>			
Maintain NSSTC public Web site, which provides the public with current information about the NSSTC, including news releases and a calendar of events.	PS	SS			✓			
Maintain Microgravity Web site, which provides current information on the Microgravity Research Program Office, as well as providing a site about microgravity designed for children.	PS	SS			<b>~</b>			
Support the Space Product Development Web site, which provides information regarding opportunities and contact names for the commercialization of space product development.	PS	SS			<b>√</b>			
Maintain Glovebox Integrated Microgravity Isolation Technology (G-LIMIT) Web site, which provides current information on the G-LIMIT system, its development and its use.	PS	SS			<b>√</b>			
Maintain Biological Crystal Growth Web site, which provides the public with current information on past, present, and future NASA crystal growth experiments.	PS	SS			<b>√</b>			
Maintain Microgravity Development Laboratory Web site, used for information dissemination to lab personnel only.	PS	SS			<b>√</b>			
Maintain Student Access to Space Web site, which provides information on Program, as well as resources for students and teachers.	PS	SS			<b>√</b>			

Voar	1.	FΥ	2006	(continu	ر الم
THAI	н.	ГΙ	ZUUD	(COIIIIII	16(1)

(10/01/05-09/30/06)

(10/01/03-09/30/00)			MSFC CIO Objective Provide a robust & interoperable IT infrastructure	MSFC CIO Objective Ensure IT resources & infrastructure are sec & accessible	MSFC CIO Objective Deliver innovative, qu products & services	MSFC CIO Objective Be the leader in delive Agency IT services	MSFC CIO Objective Balance & optimize IT investments, developi standardization. (Revi architecture to ensure does not become obs	MSFC CIO Objective Lead the technical & business managemen of IT resources at MS
MSFC CIO Initiatives	Category	State	MSF Prov inter infra	MSF Ensu infra & ac	<b>MSF</b> Deliv prod	MSF Be tl Ager	MSF Bala inve stan arch does	MSF Leac busi of IT
Provide software support for the Low-energy Neutral Atoms (LENA) instrument on the Imager for Magnetopause-to-Aurora Global Exploration (IMAGE).	PS	SS			<b>~</b>			
Provide software support for three instruments on the Polar Spacecraft, Thermal Ion Dynamics Experiment (TIDE), Ultraviolet Imager (UVI), and Plasma Source Instrument (PSI).	PS	SS			<b>√</b>			
Provide Solar Physics Support Software (SPSS) for the Vector Magnetogram Analysis Package (VMAP) and Quick VMAP (QVMAP).	PS	SS			✓			
Maintain Earth Science Web site, which provides information about Global Hydrology and Climate Center (GHCC) research.	PS	SS			✓			
Support Brazil Lightning Detection Network (BLDN). The current BLDN status and lightning activity are made available on the Web in near real-time to scientists, locally and in Brasilia.	PS	SS			✓			
Maintain Space Optics Manufacturing Technology Web site.	PS	SS			✓			
Participate in periodic telecons and face-to-face meetings with Advanced Technology Center and champion 1-NASA S&MA tools.	PS	SS			<b>~</b>			
Develop and support software to decode and graph data from the IMAGE project.	PS	SS			✓			
Support Solar Ultraviolet Magnetograph Instrument Program.	PS	SS			✓			
Support software development for the Gamma-Ray Large Area Space Telescope (GLAST).	PS	SS			✓			
Provide customer applications and services on midrange computing systems. Specific customers include Code T, TD64, WebTADS, SOLAR, NAIS,NOSC, NEMS, and general MSFC midrange systems.	OAIT	SS			<b>✓</b>			
Evaluate, design, and develop midrange systems based on customer business needs and requirements. Activity occurs as necessary.	OAIT	SS			<b>√</b>			
Provide high quality products and services to NISN customers, conduct NISN customer forums, conduct NISN site visits.	OAIT	SS			<b>√</b>			
Provide a comprehensive range of IT Services that are competitively priced in a secure, reliable $7\times 24$ World Class Data Center.	OAIT	SS			<b>√</b>			
Provide timely IT assessments and visibility into IT activities via roundtable discussions, management status reports, and all-hands briefings.	OAIT	SS			✓			
Create CRM plans, programs, and interfaces to keep the customers informed of IT initiatives.	OAIT	SS			<b>√</b>			
Develop and implement plan to improve customer satisfaction of products and services, update catalog, and develop benchmarks and cost comparisons for customers.	OAIT	SS			<b>√</b>			
Implement a customer experience management evaluation process by conducting customer research.	OAIT	SS			✓			
Improved availability of cellular services at MSFC.	OAIT	SS			✓			
Upgrade services for Russian Operations support, including PGP licenses, Web site for HSFP–R and NISN/RSVG requirements, PC Waterfall, video streaming, and office set-up.	OAIT	SS			✓			

80 \_\_\_\_\_

Year 1: FY 2006 (continued)								
(10/01/05–09/30/06)			MSFC CIO Objective 1 Provide a robust & interoperable IT infrastructure	MSFC CIO Objective 2 Ensure IT resources & infrastructure are secure & accessible	MSFC CIO Objective 3 Deliver innovative, quality products & services	MSFC CIO Objective 4 Be the leader in delivering Agency IT services	MSFC CIO Objective 5 Balance & optimize IT investments, development, standardization. (Review IT architecture to ensure it does not become obsolete.)	MSFC CIO Objective 6 Lead the technical & business management of IT resources at MSFC
MSFC CIO Initiatives	Category	State	MSI Pro inter infra	Ensi infra & ad	MSI Deli proc	MSI Be t Age	MSI Bala inve stan arch does	MSI Lead busi of IT
Improve STS launch imagery, establish HDTV downlink station development test objective & imaging sensor, & create ISS downlink enhancement architecture.	PS	SS			✓			
Improve shuttle ascent & landing ground camera systems, accomplish HDTV downlink Station Development Test Objective.	PS	SS			✓			
Provide Agency-wide services & support to all customers & potential customers.	MP/MP	SS				<b>√</b>		
Maintain the Materials & Processes Technical Information System (MAPTIS), which serves all NASA Enterprises by capitalizing on information technologies to satisfy unique customer requirements.	PS	SS				<b>√</b>		
Workforce Integrated Management System (WIMS).	OAIT	SS				✓		
HQ E-Mail Initiative (HEMI).	OAIT	SS				✓		
Consolidate Agency IT Infrastructure under the NASA Data Center (NDC).	OAIT	SS				<b>√</b>		
Provide high-quality Agencywide IT support. Support NASA budget system, participate in face-to-face meetings for various Agency-wide products, & conduct HQ & center customer visits.	OAIT	SS				<b>√</b>		
Provide comprehensive range of NASA Data Center IT services at competitive prices.	OAIT	SS				✓		
Establish & maintain an integrated IT Planning framework process that ensures alignment of business & IT goals.	OAIT	SS					✓	
Implement IT management tools & processes, including a CIO balanced scorecard process, change management system, business case process, & a business value assessment tool.	OAIT	SS					<b>√</b>	
Design, develop & implement the "As Is" Enterprise Architecture for MSFC, including definition of tools for analysis.	OAIT	SS					✓	
Build MSFC Enterprise Architecture to conform to OMB, GAO, NASA, & FEA standards.	OAIT	SS					✓	
Document/define metadata repository model & how existing & new applications & Web services fit.	OAIT	SS					✓	
Review & document standalone legacy systems & disparate technologies.	MP/MP	SS					✓	
Design, develop, & implement first cut of the "To Be" Enterprise Architecture for MSFC including definition of tools for analysis.	OAIT	SS					✓	
Establish a process to ensure new projects conform to the "To Be" Enterprise Architecture as much as it is defined at that juncture.	OAIT	SS					✓	
Provide a Web-enabled process to update, analyze, & support the management of critical assets & capabilities at MSFC.	OAIT	SS						<b>√</b>
Manage GSD Filemaker LAN deployed databases. The files hosted on this server are primarily problem tracking/reporting databases for TReK, CoFR, & Risk Management tracking databases.	PS	SS						<b>√</b>
Maintain Shuttle Engineering Support Center (PCGoal) systems, used to analyze & diagnose Space Shuttle Element anomalies in the prelaunch time frame.	PS	SS						✓
Support Meteorological Interactive Data Display System (MIDDS), which will process meteorological weather data in support of Shuttle prelaunch preparation & launch activities.	PS	SS						✓

<b>Year 1: FY 2006</b> (continued) (10/01/05–09/30/06)			stive 1 &	tive 2 ces & e secure	itive 3 e, quality ces	itive 4 delivering es	itive 5 ize IT elopment, (Review IT nsure it	tive 6 al & ement t MSFC
		MSFC CIO Objective 1 Provide a robust & interoperable IT infrastructure	MSFC CIO Objective 2 Ensure IT resources & infrastructure are secure & accessible	MSFC CIO Objective 3 Deliver innovative, quality products & services	MSFC CIO Objective 4 Be the leader in delivering Agency IT services	MSFC CIO Objective 5 Balance & optimize IT investments, development, standardization. (Review IT architecture to ensure it does not become obsolete.)	MSFC CIO Objective 6 Lead the technical & business management of IT resources at MSFC	
MSFC CIO Initiatives	Category	State	MSF Prov inter infra	MSF Ensu infra & ac	MSF Deliv prod	MSF Be th Ager	MSF Balai inveg stan archi does	MSF Lead busi of IT
MAF Product Manager Migration.	PS	SS						✓
Provide IT Project expertise to MSFC and NASA. Establish rapport with MSFC and NASA to offer IT expertise and project management for MSFC or Agencywide IT initiatives.	MP/MP	SS						✓
Provide an interface to support all initiatives of the NASA CIO. Submit annual IT and Center POP to NASA CIO, Evaluate and provide input to proposed policies, provide all required reports.	MP/MP	SS						✓
Support the NSSC implementation.	MP/MP	SS						✓
Evaluate, develop, and implement an IT risk management process.	OAIT	SS						✓
Evaluate the unified messaging initiative, XML working group, future wireless technologies, and others for use in the Office of the CIO scope.	OAIT	SS						<b>√</b>
Create Executive Information System, an automated group of applications/services for the MSFC executive management team.	OAIT	SS						<b>√</b>
Support Flight Projects Directorate Information System, a read-only information system that serves as a management tool to track Civil Service Workforce utilization on the projects managed by Flight Projects.	PS	SS						<b>√</b>
Obtain Project Management Certification for all Agency Project Managers.	MP/MP	SS						✓
Gather information and create the baseline of core competencies and critical skills necessary for the Office.	OAIT	SS						<b>√</b>
Identify organizational training coordinators, develop consolidated organizational training plans and identify specific training budget requirements for FY 2005.	OAIT	SS						<b>√</b>
Participate in initiatives to leverage IM/IT best practices and lessons learned. Conduct technology forums and sponsor technology trade shows.	OAIT	SS						✓

Year 2: FY 2007							, L .	
(10/01/06–09/30/07)		MSFC CIO Objective 1 Provide a robust & interoperable IT infrastructure	MSFC CIO Objective 2 Ensure IT resources & infrastructure are secure & accessible	MSFC CIO Objective 3 Deliver innovative, quality products & services	MSFC CIO Objective 4 Be the leader in delivering Agency IT services	MSFC CIO Objective 5 Balance & optimize IT investments, development, standardization. (Review IT architecture to ensure it does not become obsolete.)	MSFC CIO Objective 6 Lead the technical & business management of IT resources at MSFC	
MSFC CIO Initiatives	Category	State	MSF Prov inter infra	MSF Ensu infra & ac	MSF Deliv prod	MSF Be th Ager	MSF Balaı inveş stanı archi does	MSF Lead busii of IT
Development of a Mobile Technology policy.	OAIT	SS	✓					
Provide WebEx service.	OAIT	SS	✓					
Design, develop, and implement a system to provide streaming video content to the user's desktop.	OAIT	SS	✓					
Provide HOSC Internet Voice Distribution Systems (IVoIDS) to <i>ISS</i> Payload Operations support personnel.	PS	SS	✓					
Implement fast-Gigabit Ethernet HOSC <i>ISS</i> Downlink Enhancement Architecture (IDEA).	PS	SS	<b>√</b>					
HQ E-Mail Initiative (HEMI).	MP/MP	SS	✓					
Building 4600 Network Installation.	OAIT	SS	✓					
Expand deployment of Mobile Technology capabilities at MSFC.	OAIT	SS	<b>√</b>					
Operate & maintain secure voice, data, & video communications services.	OAIT	SS	✓					
Support Advanced Engineering Environment (AEE) Infrastucture Team.	MP/MP	SS	✓					
Provide NACC rate options for variable billing to Centers.	OAIT	SS	✓					
Research Data Center Lab, which will provide the capability to perform isolated product & equipment V&V.	MP/MP	SS	✓					
Determine needed upgrades for the MSFC Local Area Network (LAN).	OAIT	SS	✓					
Document/define metadata repository model & how existing & new applications and Web services fit.	OAIT	SS	✓					
Develop best practices and processes for Software Engineering Process Group (SEPG) development & maintenance.	OAIT	SS	<b>✓</b>					
Explore ultra-computer capabilities for use at MSFC	OAIT	SS	✓					
Integrate existing knowledge management systems across MSFC; repository of information to be easily accessed & searched by employees.	OAIT	SS	✓					
Common Badge Access Control (CBACS) & Smart Card.	OAIT	SS		✓				
Develop, implement & ensure compliance with Agency and Center IT Security Policy.	OAIT	SS		✓				
Institute NASA-wide physical access control system via SmartCard technology.	OAIT	SS		✓				
Implement Fail-over Database Capability for NASA Cyber Attack Response System (NCARS).	OAIT	SS		✓				
IT Security Center Phase II.	OAIT	SS		✓				
Enhance the security posture for NASA, via implementing SRR69 Agency perimeter firewall infrastructure, aligning NSSTC network with Agency and Center domain structure, annual review of IT security, service continuity, contingency, & disaster recovery plan.	OAIT	SS		<b>√</b>				
Ensure Center IT System Certification & Accreditation.	OAIT	SS		✓				
Provide required IT Security Training & Certification opportunities.	OAIT	SS		✓				
Provide Plan of Actions & Milestones (POA&M) tracking & reporting of IT Security Weaknesses.	OAIT	SS		✓				
Define a common process for applications security for application/web access depending on security level.	OAIT	SS		✓				

# Year 2: FY 2007 (continued)

(10/01/06-09/30/07)

(10/01/00 05/00/01)			MSFC CIO Objective Provide a robust & interoperable IT infrastructure	MSFC CIO Objective Ensure IT resources & infrastructure are sec & accessible	MSFC CIO Objective Deliver innovative, qu products & services	MSFC CIO Objective Be the leader in delive Agency IT services	MSFC CIO Objective Balance & optimize I investments, develop standardization. (Rev architecture to ensurr does not become obs	MSFC CIO Objective Lead the technical & business managemer of IT resources at MS
MSFC CIO Initiatives	Category	State	MSF Prov inter infra	MSF Ensu infra & ac	MSF Deliv prod	MSF Be th Ager	MSF Bala inves stan arch does	MSF Lead busi of IT
Support the Global Hydrology Research Center (GHRC), which provides both historical & current Earth science data, information, & products from satellite, airborne, & surface-based instruments.	MP/MP	SS			<b>~</b>			
Provide hardware & software maintenance & IT support personnel for Earth Planetary Science data servers, satellite data processing, & archives.	MP/MP	SS			<b>✓</b>			
Office of Biological & Physical Research Image Gallery Web Site.	PS	SS			✓			
Maintain Payloads 1 Web server, which provides ISS information, i.e., payload integration & operations data.	PS	SS			✓			
Maintain the Payload Data Library (PDL), which allows users access to data associated with their assigned payloads, as approved by NASA authorized personnel.	MP/MP	SS			<b>√</b>			
Maintain the Telescience Support Center (TSC), which provides user connectivity to the Payload Operations & Integration Center (POIC) Data, Voice, & Video Systems.	MP/MP	SS			<b>√</b>			
Provide customer support for X-ray Calibration Facility (XRCF), including system administration, system loading & updating, & IT security.	PS	SS			✓			
Advanced Microwave Scanning Radiometer (AMSR-E) & Earth Science Information Partner (SIPS) Data Processing.	PS	SS			<b>~</b>			
Maintain FD42 Mission Planning development systems.	MP/MP	SS			✓			
Support development, deployment, & operation of the Integrated Engineering Capability Design & Data Management System.	MP/MP	SS			<b>√</b>			
Provide National Space Sciences & Technology Center (NSSTC) with IT infrastructure & customer support.	OAIT	SS			✓			
Provide Windows-based testing & archiving systems for the Environmental Control & Life Support System (ECLSS) Development subsystems in support ISS.	PS	SS			✓			
Provide hosting to the Ground Systems Department Web Site, home of the Telescience Resource Kit (TReK) that ISS payloads scientists can use to control their payloads remotely.	PS	SS			<b>√</b>			
Support Huntsville Operations Support Center (HOSC) Payload Operations Integration Center (POIC) systems.	MP/MP	SS			<b>√</b>			
Develop the Lightning Mapping Array (LMA), which will consist of 12 measurement stations deployed over northern Alabama. Information is relayed to the NSSTC through a microwave communications link.	MP/MP	SS			<b>√</b>			
Perform software development, digital signal processing, & monitoring of audio labs systems.	MP/MP	SS			<b>√</b>			
Manage Lightning Imaging Sensor data, including two types of science, housekeeping, & ephemeris data daily. The data are used worldwide by the lightning scientific community.	MP/MP	SS			<b>√</b>			
Support Integrated Engineering System (IES), the primary CAD/CAM/CAE system at MSFC.	PS	SS			<b>√</b>			
Maintain Optical Plume Anomaly Detection Lab (OPAD) system used to analyze plumes that occur during mission specific occurrence.	PS	SS			✓			
Operate Space Shuttle Main Engine (SSME) Hardware Simulation Laboratory, which supports flight hardware & software verification in support of the SSME.	PS	SS			✓			

84 \_\_\_\_\_

Year 2: FY 2007 (continued	Year	2: FY	2007	(continued	)
----------------------------	------	-------	------	------------	---

(10/01/06-09/30/07)

(10/01/00-09/30/07)			MSFC CIO Objective Provide a robust & interoperable IT infrastructure	MSFC CIO Objective Ensure IT resources & infrastructure are sec & accessible	MSFC CIO Objective Deliver innovative, qu products & services	MSFC CIO Objective Be the leader in delive Agency IT services	MSFC CIO Dijective Balance & optimize IT investments, developi standardization. (Revi architecture to ensure does not become obs	MSFC CIO Objective Lead the technical & business managemen of IT resources at MS
MSFC CIO Initiatives	Category	State	MSF Provi inter infra	MSF Ensu infras & aco	MSF Deliv prod	MSF Be th Agen	MSF Balar inves stanc archi does	MSF Lead busir of IT
Operate Controller Software Lab (CSL), the mirrored Site of the HSL. The lab is located in Research Park at the Boeing facility.	PS	SS			✓			
Support Flight Software Development system used to develop embedded flight software for various programs.	MP/MP	SS			✓			
Support Antenna Range Data Collection and Analysis System (ARDCAS).	PS	SS			✓			
Support Radio Frequency Lab system used to develop radio frequency simulations and analyze the results.	PS	SS			✓			
Maintain the Contact Dynamic Simulation Lab and the Flight Robotics Lab (FRL).	PS	SS			✓			
Maintain the Avionics System Testbed (MAST).	PS	SS			✓			
Support Ascent Imagery analysis of Shuttle elements.	PS	SS			✓			
Support Collaborative engineering design, analysis and visualization.	PS	SS			<b>√</b>			
Support the Virtual Research Center (VRC), a Web-based project management system that provides a central location for making project data available to geographically dispersed teams.	MP/MP	SS			✓			
Maintain the Materials And Processes Technical Information System (MAPTIS), which serves all NASA Enterprises by capitalizing on information technologies to satisfy unique customer requirements.	MP/MP	SS			<b>√</b>			
Maintain High-resolution Digital Radiography (HRDR) system, which is connected to the NASA private network to FTP digital x-ray images from UNIX systems.	PS	SS			✓			
Support the Flash Computed Tomography (FlashCT) system, used to CT composites, ceramics, small metallic castings and components.	PS	SS			✓			
Support Collaborative Engineering Center, a facility for advanced visualization and multidiscipline engineering analysis.	PS	SS			✓			
Manage Ground Systems Department Web-deployed databases, where customer survey data is collected for HOSC.	PS	SS			<b>√</b>			
Participate in Incident Reporting Information System (IRIS) User Group, and perform MSFC administrative functions and interfaces as necessary.	PS	SS			<b>√</b>			
Support Science Directorate Internal Web site to provide NASA employees with current information on the Science Directorate.	MP/MP	SS			✓			
Maintain Science Directorate Science Communication Web site to help the public understand how exciting NASA research is and help NASA scientists fulfill their outreach responsibilities.	MP/MP	SS			<b>√</b>			
Maintain the Science Directorate Publications Metrics Database (SDMD), used to enter and retrieve information regarding the professional and community activities of NASA and contract scientists.	MP/MP	SS			<b>√</b>			
Maintain NSSTC Personnel List Web Application, which allows the searching of the NSSTC personnel list by several options.	MP/MP	SS			<b>√</b>			
Maintain NSSTC public Web site, which provides the public with current information about the NSSTC, including news releases and a calendar of events.	PS	SS			<b>√</b>			

<b>Year 2: FY 2007</b> (continued) (10/01/06–09/30/07)			MSFC CIO Objective 1 Provide a robust & interoperable IT infrastructure	MSFC CIO Objective 2 Ensure IT resources & infrastructure are secure & accessible	MSFC CIO Objective 3 Deliver innovative, quality products & services	<b>MSFC CIO Objective 4</b> Be the leader in delivering Agency IT services	MSFC CIO Objective 5 Balance & optimize IT investments, development, standardization. (Review IT architecture to ensure it does not become obsolete.)	MSFC CIO Objective 6 Lead the technical & business management of IT resources at MSFC
MSFC CIO Initiatives	Category	State	Pro inte	MS Ens infr		MS Be Age	MS Bal inv inv sta arc doe	MS Lea bus
Maintain Microgravity Web site, which provides current information on the Microgravity Research Program Office, as well as providing a site about microgravity designed for children.	PS	SS			<b>√</b>			
Support the Space Product Development Web site, which provides information regarding opportunities & contact names for the commercialization of space product development.	PS	SS			✓			
Maintain Glovebox Integrated Microgravity Isolation Technology (G-LIMIT) Web site, which provides current information on the G-LIMIT system, its development & its use.	PS	SS			<b>√</b>			
Maintain Biological Crystal Growth Web site, which provides the public with current information on past, present, & future NASA crystal growth experiments.	PS	SS			<b>√</b>			
Maintain Microgravity Development Laboratory Web site, used for information dissemination to lab personnel only.	PS	SS			✓			
Maintain Student Access to Space Web site, which provides information on Program, as well as resources for students & teachers.	PS	SS			✓			
Provide software support for the Low-energy Neutral Atoms (LENA) instrument on the Imager for Magnetopause-to-Aurora Global Exploration (IMAGE).	PS	SS			✓			
Provide software support for three instruments on the Polar Spacecraft, Thermal Ion Dynamics Experiment (TIDE), Ultraviolet Imager (UVI), & Plasma Source Instrument (PSI).	PS	SS			✓			
Provide Solar Physics Support Software (SPSS) for the Vector Magnetogram Analysis Package (VMAP) & Quick VMAP (QVMAP).	PS	SS			<b>√</b>			
Maintain Earth Science Web site, which provides information about Global Hydrology & Climate Center (GHCC) research.	PS	SS			✓			
Support Brazil Lightning Detection Network (BLDN). The current BLDN status & lightning activity are made available on the Web in near real-time to scientists, locally & in Brasilia.	PS	SS			<b>√</b>			
Maintain Space Optics Manufacturing Technology Web site.	PS	SS			✓			
Participate in periodic telecons & face-to-face meetings with Advanced Technology Center & champion 1-NASA S&MA tools.	PS	SS			✓			
Develop & support software to decode & graph data from the IMAGE project.	PS	SS			✓			
Support Solar Ultraviolet Magnetograph Instrument Program.	PS	SS			<b>√</b>			
Support software development for the Gamma-Ray Large Area Space Telescope (GLAST).	PS	SS			✓			
Provide customer applications & services on midrange computing systems. Specific customers include Code T, TD64, WebTADS, SOLAR, NAIS,NOSC, NEMS, & general MSFC midrange systems.	OAIT	SS			<b>√</b>			
Evaluate, design, & develop midrange systems based on customer business needs & requirements. Activity occurs as necessary.	OAIT	SS			<b>√</b>			
Provide a comprehensive range of IT Services that are competitively priced in a secure, reliable $7\times24$ World Class Data Center.	OAIT	SS			<b>√</b>			

Year 2: F	Y 2007	(continued)
-----------	--------	-------------

(10/01/06-09/30/07)

(10/01/06-09/30/07)			MSFC CIO Objective 1 Provide a robust & interoperable IT infrastructure	MSFC CIO Objective 2 Ensure IT resources & infrastructure are secur & accessible	MSFC CIO Objective 3 Deliver innovative, qual products & services	<b>MSFC CIO Objective 4</b> Be the leader in deliveri Agency IT services	MSFC CIO Objective 5 Balance & optimize IT investments, developm standardization. (Review architecture to ensure it does not become obsol	MSFC CIO Objective 6 Lead the technical & business management of IT resources at MSFC
MSFC CIO Initiatives	Category	State	Prd infi	MS inf inf		MS Be Ag	MS Bal inv inv sta sta arc do	Dus projection of
Provide timely IT assessments & visibility into IT activities via roundtable discussions, management status reports, & all-hands briefings.	OAIT	SS			<b>√</b>			
Improved availability of cellular services at MSFC.	OAIT	SS			✓			
Improve STS launch imagery, establish HDTV downlink station development test objective & imaging sensor, & create ISS downlink enhancement architecture.	PS	SS			<b>√</b>			
Improve shuttle ascent & landing ground camera systems, accomplish HDTV downlink Station Development Test Objective.	PS	SS			<b>~</b>			
Manage GSD Filemaker LAN deployed databases. The files hosted on this server are primarily problem tracking/reporting databases for TReK, CoFR, & Risk Management tracking databases.	MP/MP	SS			<b>√</b>			
Support Telescience Resource Kit (TReK) systems, used for the development of TReK software deployed to ISS Payload teams around the world via the TReK Web site.	PS	SS			<b>√</b>			
Maintain Shuttle Engineering Support Center (PCGoal) systems, used to analyze & diagnose Space Shuttle Element anomalies in the prelaunch time frame.	PS	SS			<b>√</b>			
Support Meteorological Interactive Data Display System (MIDDS), which will process meteorological weather data in support of Shuttle prelaunch preparation & launch activities.	PS	SS			✓			
Support Flight Projects Directorate Information System, a read-only information system that serves as a management tool to track Civil Service Workforce utilization on the projects managed by Flight Projects.	PS	SS			<b>√</b>			
Evaluate the unified messaging initiative, XML working group, future wireless technologies, & others for use in the Office of the CIO scope.	OAIT	SS			✓			
WIMS (Workforce Integrated Management System).	OAIT	SS				✓		
Lead transition of Agency's television production infrastructure to digital television (DTV).	OAIT	SS				✓		
Provide high quality products & services to NISN customers, conduct NISN customer forums, conduct NISN site visits.	MP/MP	SS				<b>√</b>		
Provide high-quality Agencywide IT support. Support NASA budget system, participate in face-to-face meetings for various Agencywide products, & conduct HQ & center customer visits.	MP/MP	SS				<b>√</b>		
Upgrade services for Russian Operations support, including PGP licenses, Web site for HSFP-R & NISN/RSVG requirements, PC Waterfall, video streaming, & office set-up.	PS	SS				<b>√</b>		
Implement Agencywide transition to DTV.	OAIT	SS				✓		
Consolidate Agency IT Infrastructure under the NASA Data Center (NDC).	OAIT	SS				<b>✓</b>		
Provide comprehensive range of NASA Data Center IT services at competitive prices.	OAIT	SS				<b>√</b>		
Implement NASA Integrated Services Environment (NISE) initiatives NASA-wide account management (NAMS), directory services (CIMS), & identity management (IDMS).	OAIT	SS				<b>√</b>		
Support the NSSC implementation.	OAIT	SS				✓		
Provide Agency-wide services & support to all customers & potential customers.	OAIT	SS				<b>√</b>		

Year 2: FY 2007 (continued)								
(10/01/06–09/30/07)			MSFC CIO Objective 1 Provide a robust & interoperable IT infrastructure	MSFC CIO Objective 2 Ensure IT resources & infrastructure are secure & accessible	MSFC CIO Objective 3 Deliver innovative, quality products & services	MSFC CIO Objective 4 Be the leader in delivering Agency IT services	MSFC CIO Objective 5 Balance & optimize IT investments, development, standardization. (Review IT architecture to ensure it does not become obsolete.)	MSFC CIO Objective 6 Lead the technical & business management of IT resources at MSFC
MSFC CIO Initiatives	Category	State	MS Pro inte infra	MSI Ens infra & au	MS Deli pro	MS Be t Age	MS Bala inve star arch doe	MS  Lea bus of I
Establish and maintain an integrated IT Planning framework process that ensures alignment of business and IT goals.	OAIT	SS					✓	
Implement IT management tools and processes, including a CIO balanced scorecard process, change management system, business case process, and a business value assessment tool.	OAIT	SS					<b>√</b>	
Establish and maintain an integrated IT Planning framework process that ensures alignment of business and IT goals.	OAIT	SS					✓	
Implement IT management tools and processes, including a CIO balanced scorecard process, change management system, business case process, and a business value assessment tool.	OAIT	SS					<b>√</b>	
Design, develop and implement the "As Is" Enterprise Architecture for MSFC, including definition of tools for analysis.	OAIT	SS					<b>√</b>	
Build MSFC Enterprise Architecture to conform to OMB, GAO, NASA, and FEA standards.	OAIT	SS					✓	
Create CRM plans, programs, and interfaces to keep the customers informed of IT initiatives.	OAIT	SS					✓	
Develop and implement plan to improve customer satisfaction of products and services, update catalog, and develop benchmarks and cost comparisons for customers.	OAIT	SS					<b>√</b>	
Implement a customer experience management evaluation process by conducting customer research. Review and document standalone legacy systems and disparate technologies.	OAIT	SS					<b>√</b>	
Design, develop, and implement first cut of the "To Be" Enterprise Architecture for MSFC including definition of tools for analysis.	OAIT	SS					✓	
Establish a process to ensure new projects conform to the "To Be" Enterprise Architecture as much as it is defined at that juncture.	OAIT	SS					✓	
Provide a Web-enabled process to update, analyze, and support the management of critical assets and capabilities at MSFC.	OAIT	SS						<b>√</b>
MAF Product Manager Migration.	PS	SS						✓
Provide IT Project expertise to MSFC and NASA. Establish rapport with MSFC and NASA to offer IT expertise and project management for MSFC or Agencywide IT initiatives.	MP/MP	SS						<b>√</b>
Act as the MSFC representative for Center NSSC IT transition team to support transitioning of MSFC CIO Services to the NASA Shared Services Center (NSSC).	OAIT	SS						<b>√</b>
Provide an interface to support all initiatives of the NASA CIO. Submit annual IT and Center POP to NASA CIO, Evaluate and provide input to proposed policies, provide all required reports.	OAIT	SS						<b>~</b>
Evauate, develop, and implement an IT risk management process.	OAIT	SS						✓
Create Executive Information System, an automated group of applications/services for the MSFC executive management team.	OAIT	SS						<b>√</b>

Year 3: FY 2008					_	D	nt, IT (ee.)	
(10/01/07–09/30/08)			MSFC CIO Objective 1 Provide a robust & interoperable IT infrastructure	MSFC CIO Objective 2 Ensure IT resources & infrastructure are secure & accessible	MSFC CIO Objective 3 Deliver innovative, quality products & services	WSFC CIO Objective 4 Be the leader in delivering Agency IT services	MSFC CIO Objective 5 Balance & optimize IT investments, development, standardization. (Review IT architecture to ensure it does not become obsolete.)	MSFC CIO Objective 6 Lead the technical & business management of IT resources at MSFC
MSFC CIO Initiatives	Category	State	MSF Prov inter	MSF Ensu infra & ac	MSF Deliv prod	MSF Be th Agen	MSF Balar inves stand archi does	MSF Lead busir of IT
Development of a Mobile Technology policy.	OAIT	SS	✓					
Provide WebEx service.	OAIT	SS	✓					
Design, develop, & implement a system to provide streaming video content to the user's desktop.	OAIT	SS	✓					
Support development, deployment, & operation of the Integrated Engineering Capability Design & Data Management System.	MP/MP	SS	<b>√</b>					
Provide HOSC Internet Voice Distribution Systems (IVoIDS) to ISS Payload Operations support personnel.	PS	SS	<b>√</b>					
Implement fast-Gigabit Ethernet HOSC ISS Downlink Enhancement Architecture (IDEA).	PS	SS	✓					
VoIP Pilot.	MP/MP	SS	✓					
Integrated Collaborative Environment (ICE).	MP/MP	SS	<b>√</b>					
Windchill Implementation Integrated Engineering Capability.	MP/MP	SS	✓					
Building 4600 Network Installation.	OAIT	SS	✓					
Upgrade Center document management capabilities.	OAIT	SS	✓					
Expand deployment of Mobile Technology capabilities at MSFC.	OAIT	SS	<b>√</b>					
Operate & maintain secure voice, data, & video communications services.	OAIT	SS	✓					
Support Advanced Engineering Environment (AEE) Infrastucture Team.	MP/MP	SS	✓					
Research Data Center Lab, which will provide the capability to perform isolated product & equipment V&V.	MP/MP	SS	✓					
Determine needed upgrades for the Marshall Local Area Network (LAN).	OAIT	SS	✓					
Document/define metadata repository model & how existing & new applications & Web services fit.	OAIT	SS	✓					
Explore ultra-computer capabilities for use at MSFC.	OAIT	SS	✓					
Integrate existing knowledge management systems across MSFC; repository of information to be easily accessed & searched by employees.	OAIT	SS	<b>√</b>					
Common Badge Access Control (CBACS) & Smart Card.	OAIT	SS		✓				
Implement Fail-over Database Capability for NASA Cyber Attack Response System (NCARS).	OAIT	SS		✓				
IT Security Center Phase II.	OAIT	SS		✓				
Intrusion Detection System Router Upgrade.	OAIT	SS		<b>√</b>				
Develop, Implement & Monitor the MSFC IT Security Program.	OAIT	SS		<b>√</b>				
Implement Center IT Security vulnerability identification & mitigation program.	OAIT	SS		✓				
Implement Center IT Security incident response & investigation capability.	OAIT	SS		✓				
Enhance the security posture for NASA, via implementing SRR69 Agency perimeter firewall infrastructure, aligning NSSTC network with Agency & Center domain structure, annual review of IT security, service continuity, contingency, & disaster recovery plan.	OAIT	SS		<b>√</b>				
Ensure Center IT System Certification & Accreditation.	OAIT	SS		✓				
Provide required IT Security Training & Certification opportunities.	OAIT	SS		✓				

Year	3:	FY	2008	(continued)
------	----	----	------	-------------

Year 3: FY 2008 (continued)							_	
(10/01/07–09/30/08)			MSFC CIO Objective 1 Provide a robust & interoperable IT infrastructure	MSFC CIO Objective 2 Ensure IT resources & infrastructure are secure & accessible	MSFC CIO Objective 3 Deliver innovative, quality products & services	MSFC CIO Objective 4 Be the leader in delivering Agency IT services	MSFC CIO Objective 5 Balance & optimize IT investments, development, standardization. (Review IT architecture to ensure it does not become obsolete.)	MSFC CIO Objective 6 Lead the technical & business management of IT resources at MSFC
MSFC CIO Initiatives	Category	State	MSF Prov inter infra	MSF Enst infra & ac	MSF Deliv proc	MSF Be tl Age	MSF Bala Bala inve stan arch does	MSF Lead busi of IT
Provide Plan of Actions & Milestones (POA&M) tracking & reporting of IT Security Weaknesses.	OAIT	SS		<b>✓</b>				
Define a common process for applications security for application/web access depending on security level.	OAIT	SS		✓				
Provide NACC rate options for variable billing to Centers.	OAIT	SS			✓			
Support the Global Hydrology Research Center (GHRC), which provides both historical & current Earth science data, information, & products from satellite, airborne, & surface-based instruments.	MP/MP	SS			<b>√</b>			
Provide hardware & software maintenance & IT support personnel for Earth Planetary Science data servers, satellite data processing, & archives.	MP/MP	SS			<b>√</b>			
Office of Biological & Physical Research Image Gallery Web Site.	PS	SS			<b>√</b>			
Maintain Payloads 1 Web server, which provides <i>ISS</i> information such as payload integration & operations data.	PS	SS			<b>√</b>			
Maintain the Payload Data Library (PDL), which allows users access to data associated with their assigned payloads, as approved by NASA authorized personnel.	MP/MP	SS			<b>√</b>			
Maintain the Telescience Support Center (TSC), which provides user connectivity to the Payload Operations & Integration Center (POIC) Data, Voice, & Video Systems.	MP/MP	SS			<b>√</b>			
Provide customer support for X-ray Calibration Facility (XRCF), including system administration, system loading & updating, & IT security.	PS	SS			<b>√</b>			
Advanced Microwave Scanning Radiometer (AMSR-E) & Earth Science Information Partner (SIPS) Data Processing.	PS	SS			<b>√</b>			
Maintain FD42 Mission Planning development systems.	MP/MP	SS			<b>√</b>			
Provide National Space Sciences & Technology Center (NSSTC) with IT infrastructure & customer support.	OAIT	SS			<b>√</b>			
Provide Windows-based testing & archiving systems for the Environmental Control & Life Support System (ECLSS) Development subsystems in support ISS.	PS	SS			<b>√</b>			
Provide hosting to the Ground Systems Department Web Site, home of the Telescience Resource Kit (TReK) that <i>ISS</i> payloads scientists can use to control their payloads remotely.	PS	SS			<b>√</b>			
Support Huntsville Operations Support Center (HOSC) Payload Operations Integration Center (POIC) systems.	MP/MP	SS			<b>√</b>			
Develop the Lightning Mapping Array (LMA), which will consist of 12 measurement stations deployed over northern Alabama. Information is relayed to the NSSTC through a microwave communications link.	PS	SS			<b>√</b>			
Perform software development, digital signal processing, & monitoring of audio labs systems.	MP/MP	SS			✓			
Manage Lightning Imaging Sensor data, including two types of science, housekeeping, & ephemeris data daily. The data are used worldwide by the lightning scientific community.	MP/MP	SS			<b>√</b>			
Support Integrated Engineering System (IES), the primary CAD/CAM/CAE system at MSFC.	PS	SS			✓			
Maintain Optical Plume Anomaly Detection Lab (OPAD) system used to analyze plumes that occur during mission specific occurrence.	PS	SS			<b>√</b>			

90 \_

<b>/ear 3: FY 2008</b> (continued) 10/01/07–09/30/08)			MSFC CIO Objective 1 Provide a robust & interoperable IT interoperable IT interoperable IT interostructure	MSFC CIO Objective 2 Ensure IT resources & infrastructure are secure & accessible	MSFC CIO Objective 3 Deliver innovative, quality products & services	<b>MSFC CIO Objective 4</b> Be the leader in delivering Agency IT services	MSFC CIO Objective 5 Balance & optimize IT investments, development, standardization. (Review IT architecture to ensure it does not become obsolete.)	MSFC CIO Objective 6 Lead the technical & business management of IT resources at MSFC
MSFC CIO Initiatives	Category	State	MSF Provi inter infra	MSF Ensu infrag & aco	MSF Deliv prod	MSF Be th Agen	MSF Balar inves stanc archi does	MSF Lead busir of IT
Operate Space Shuttle Main Engine (SSME) Hardware Simulation Laboratory, which supports flight hardware and software verification in support of the SSME.	PS	SS			✓			
Operate Controller Software Lab (CSL), the mirrored Site of the HSL. The lab is located in Research Park at the Boeing facility.	PS	SS			<b>√</b>			
Support Flight Software Development system used to develop embedded flight software for various programs.	MP/MP	SS			<b>~</b>			
Support Antenna Range Data Collection and Analysis System (ARDCAS).	PS	SS			✓			
Support Radio Frequency Lab system used to develop radio frequency simulations and analyze the results.	PS	SS			✓			
Maintain the Contact Dynamic Simulation Lab and the Flight Robotics Lab (FRL).	PS	SS			<b>√</b>			
Maintain the Avionics System Testbed (MAST).	PS	SS			✓			
Support Ascent Imagery analysis of Shuttle elements.	PS	SS			✓			
Support Collaborative engineering design, analysis and visualization.	PS	SS			<b>√</b>			
Support the Virtual Research Center (VRC), a Web-based project management system that provides a central location for making project data available to geographically dispersed teams.	MP/MP	SS			<b>√</b>			
Maintain the Materials And Processes Technical Information System (MAPTIS), which serves all NASA Enterprises by capitalizing on information technolo- gies to satisfy unique customer requirements.	MP/MP	SS			<b>√</b>			
Maintain High-resolution Digital Radiography (HRDR) system, which is connected to the NASA private network to FTP digital x-ray images from UNIX systems.	PS	SS			<b>√</b>			
Support the Flash Computed Tomography (FlashCT) system, used to CT composites, ceramics, small	PS	SS			✓			

System (ARDCAS).	P5	55		ľ		
Support Radio Frequency Lab system used to develop radio frequency simulations and analyze the results.	PS	SS		✓		
Maintain the Contact Dynamic Simulation Lab and the Flight Robotics Lab (FRL).	PS	SS		<b>√</b>		
Maintain the Avionics System Testbed (MAST).	PS	SS		✓		
Support Ascent Imagery analysis of Shuttle elements.	PS	SS		✓		
Support Collaborative engineering design, analysis and visualization.	PS	SS		✓		
Support the Virtual Research Center (VRC), a Web-based project management system that provides a central location for making project data available to geographically dispersed teams.	MP/MP	SS		<b>√</b>		
Maintain the Materials And Processes Technical Information System (MAPTIS), which serves all NASA Enterprises by capitalizing on information technologies to satisfy unique customer requirements.	MP/MP	SS		<b>√</b>		
Maintain High-resolution Digital Radiography (HRDR) system, which is connected to the NASA private network to FTP digital x-ray images from UNIX systems.	PS	SS		<b>√</b>		
Support the Flash Computed Tomography (FlashCT) system, used to CT composites, ceramics, small metallic castings and components.	PS	SS		<b>√</b>		
Support Collaborative Engineering Center, a facility for advanced visualization and multidiscipline engineering analysis.	PS	SS		✓		
Manage Ground Systems Department Web-deployed databases, where customer survey data is collected for HOSC.	PS	SS		✓		
Participate in Incident Reporting Information System (IRIS) User Group, and perform MSFC administrative functions and interfaces as necessary.	PS	SS		✓		
Support Science Directorate Internal Web site to provide NASA employees with current information on the Science Directorate.	MP/MP	SS		✓		
Maintain Science Directorate Science Communication Web site to help the public understand how exciting NASA research is and help NASA scientists fulfill their outreach responsibilities.	MP/MP	SS		<b>√</b>		
Maintain the Science Directorate Publications Metrics Database (SDMD), used to enter and retrieve information regarding the professional and commu- nity activities of NASA and contract scientists.	MP/MP	SS		<b>√</b>		
Maintain NSSTC Personnel List Web Application, which allows the searching of the NSSTC personnel list by several options.	OAIT	SS		<b>√</b>		
Maintain NSSTC public Web site, which provides the public with current information about the NSSTC, including news releases and a calendar of events.	PS	SS		✓		

Year 3: FY 2008 (continued)				-	Ŋ.	g	nt, -1T (te.)	
(10/01/07–09/30/08)			MSFC CIO Objective 1 Provide a robust & interoperable IT infrastructure	MSFC CIO Objective 2 Ensure IT resources & infrastructure are secure & accessible	MSFC CIO Objective 3 Deliver innovative, quality products & services	MSFC CIO Objective 4 Be the leader in delivering Agency IT services	MSFC CIO Objective 5 Balance & optimize IT investments, development, standardization. (Review IT architecture to ensure it does not become obsolete.)	MSFC CIO Objective 6 Lead the technical & business management of IT resources at MSFC
MSFC CIO Initiatives	Category	State	MS Pro inte	MS Ens infr	MS Deli pro	MS Be i Age	MS Bala inve star arcl doe	MS Lea bus of I
Maintain Microgravity Web site, which provides current information on the Microgravity Research Program Office, as well as providing a site about microgravity designed for children.	PS	SS			✓			
Support the Space Product Development Web site, which provides information regarding opportunities & contact names for the commercialization of space product development.	PS	SS			<b>√</b>			
Maintain Glovebox Integrated Microgravity Isolation Technology (G-LIMIT) Web site, which provides current information on the G-LIMIT system, its development & its use.	PS	SS			<b>√</b>			
Maintain Biological Crystal Growth Web site, which provides the public with current information on past, present, & future NASA crystal growth experiments.	PS	SS			<b>√</b>			
Maintain Microgravity Development Laboratory Web site, used for information dissemination to lab personnel only.	PS	SS			<b>✓</b>			
Maintain Student Access to Space Web site, which provides information on Program, as well as resources for students & teachers.	PS	SS			<b>√</b>			
Provide software support for the Low-energy Neutral Atoms (LENA) instrument on the Imager for Magneto- pause-to-Aurora Global Exploration (IMAGE).	PS	SS			<b>√</b>			
Provide software support for three instruments on the Polar Spacecraft, Thermal Ion Dynamics Experiment (TIDE), Ultraviolet Imager (UVI), & Plasma Source Instrument (PSI).	PS	SS			✓			
Provide Solar Physics Support Software (SPSS) for the Vector Magnetogram Analysis Package (VMAP) & Quick VMAP (QVMAP).	PS	SS			<			
Maintain Earth Science Web site, which provides information about Global Hydrology & Climate Center (GHCC) research.	PS	SS			<b>√</b>			
Support Brazil Lightning Detection Network (BLDN). The current BLDN status & lightning activity are made available on the Web in near real-time to scientists, locally & in Brasilia.	PS	SS						
Maintain Space Optics Manufacturing Technology Web site.	PS	SS			✓			
Participate in periodic telecons & face-to-face meetings with Advanced Technology Center & champion 1-NASA S&MA tools.	PS	SS			<b>√</b>			
Develop & support software to decode & graph data from the IMAGE project.	PS	SS			<b>√</b>			
Support Solar Ultraviolet Magnetograph Instrument Program.	PS	SS			<b>√</b>			
Support software development for the Gamma-Ray Large Area Space Telescope (GLAST).	PS	SS			✓			
Provide customer applications & services on midrange computing systems. Specific customers include Code T, TD64, WebTADS, SOLAR, NAIS,NOSC, NEMS, & general MSFC midrange systems.	OAIT	SS			<b>√</b>			
Evaluate, design, & develop midrange systems based on customer business needs & requirements. Activity occurs as necessary.	OAIT	SS			<b>√</b>			
Provide a comprehensive range of IT Services that are competitively priced in a secure, reliable $7\times24$ World Class Data Center.	OAIT	SS			<b>√</b>			

#### Year 3: FY 2008 (continued) MSFC CIO Objective 4 Be the leader in delivering Agency IT services does not become obsolete. standardization. (Review IT investments, development Lead the technical & business management of IT resources at MSFC MSFC CIO Objective 3 Deliver innovative, quality infrastructure are secure MSFC CIO Objective 1 Provide a robust & interoperable IT infrastructure (10/01/07-09/30/08) MSFC CIO Objective 5 Balance & optimize IT architecture to ensure it MSFC CIO Objective 6 CIO Objective products & services & accessible **MSFC CIO Initiatives** Category State Provide high-quality Agencywide IT support. Support OAIT SS NASA budget system, participate in face-to-face meetings for various Agencywide products, & conduct HQ & center customer visits. OAIT Provide timely IT assessments & visibility into IT SS activities via roundtable discussions, management status reports, & all-hands briefings Improved availability of cellular services at MSFC. OAIT SS Improve STS launch imagery, establish HDTV downlink SS PS station development test objective & imaging sensor, & create ISS downlink enhancement architecture. Improve shuttle ascent & landing ground camera SS PS systems, accomplish HDTV downlink Station Development Test Objective Manage GSD Filemaker LAN deployed databases. The MP/MP SS files hosted on this server are primarily problem tracking/reporting databases for TReK, CoFR, & Risk Management tracking databases. Support Telescience Resource Kit (TReK) systems, used SS PS for the development of TReK software deployed to ISS Payload teams around the world via the TReK Web site. Maintain Shuttle Engineering Support Center (PCGoal) PS SS systems, used to analyze & diagnose Space Shuttle Element anomalies in the prelaunch time frame. Support Meteorological Interactive Data Display System SS PS (MIDDS), which will process meteorological weather data in support of Shuttle prelaunch preparation & launch activities Support Flight Projects Directorate Information System, PS SS a read-only information system that serves as a management tool to track Civil Service Workforce utilization on the projects managed by Flight Projects. Evaluate the unified messaging initiative, XML working OAIT SS group, future wireless technologies, & others for use in the Office of the CIO scope. OAIT Maintain Recruitment One-Stop to deliver online SS recruitment services. OAIT WIMS (Workforce Integrated Management System). SS HQ E-Mail Initiative (HEMI). OAIT SS Upgrade NISN WAN backbone infrastructure. OAIT SS OAIT SS Lead transition of Agency's television production infrastructure to digital television (DTV) Institute NASA-wide physical access control system via OAIT SS SmartCard technology. Provide high quality products & services to NISN MP/MP SS customers, conduct NISN customer forums, conduct NISN site visits. Upgrade services for Russian Operations support, PS SS including PGP licenses, Web site for HSFP-R & NISN/ RSVG requirements, PC Waterfall, video streaming, & office set-up. Implement Agencywide transition to DTV. OAIT SS

Provide comprehensive range of NASA Data Center IT

Consolidate Agency IT Infrastructure under the NASA

Provide Agency-wide services & support to all

services at competitive prices.

Data Center (NDC).

customers & potential customers.

OAIT

OAIT

OAIT

SS

SS

SS

Year 3: FY 2008 (continued	Year	3: FY	2008	(continued
----------------------------	------	-------	------	------------

(10/01/07-09/30/08)

(10/01/07–09/30/08)			MSFC CIO Objective 1 Provide a robust & interoperable IT infrastructure	MSFC CIO Objective 2 Ensure IT resources & infrastructure are secu & accessible	MSFC CIO Objective 3 Deliver innovative, qua products & services	MSFC CIO Objective 4 Be the leader in deliver Agency IT services	MSFC CIO Objective 5 Balance & optimize IT investments, developm standardization. (Revie architecture to ensure does not become obso	MSFC CIO Objective 6 Lead the technical & business management of IT resources at MSF
MSFC CIO Initiatives	Category	State	MSF Prov inter infra	MSF Ensi infra & ac	MSF Delir proc	MSF Be t Age	MSF Bala inve stan arch does	MSF Lead busi of IT
Implement NASA Integrated Services Environment (NISE) initiatives NASA-wide account management (NAMS), directory services (CIMS), & identity management (IDMS).	OAIT	SS				<b>√</b>		
Support the NSSC implementation.	OAIT	SS				✓		
Establish & maintain an integrated IT Planning framework process that ensures alignment of business & IT goals.	OAIT	SS					✓	
Design, develop & implement the "As Is" EA for MSFC, including definition of tools for analysis.	OAIT	SS					✓	
Build MSFC EA to conform to OMB, GAO, NASA, & FEA.	OAIT	SS					✓	
Create CRM plans, programs, & interfaces to keep the customers informed of IT initiatives.	OAIT	SS					✓	
Develop & implement plan to improve customer satisfaction of products & services, update catalog, & develop benchmarks & cost comparisons for customers	OAIT	SS					✓	
Implement a customer experience management evaluation process by conducting customer research.	OAIT	SS					✓	
Design, develop, & implement first cut of the "To Be" EA for MSFC including definition of tools for analysis.	OAIT	SS					✓	
Establish a process to ensure new projects conform to the "To Be" EA as much as it isdefined at that juncture.	OAIT	SS					✓	
Provide a Web-enabled process to update, analyze, & support the management of critical assets & capabilities at MSFC.	OAIT	SS						✓
MAF Product Manager Migration	PS	SS						✓
Develop best practices & processes for Software Engineering Process Group (SEPG) development & maintenance.	OAIT	SS						✓
Development IT Portfolio Management Tool.	OAIT	SS						✓
Provide IT Project expertise to MSFC & NASA. Establish rapport with MSFC & NASA to offer IT expertise & project management for MSFC or Agency-wide IT initiatives.	MP/MP	SS						<b>√</b>
Provide an interface to support all initiatives of the NASA CIO. Submit annual IT & Center POP to NASA CIO, Evaluate & provide input to proposed policies, provide all required reports.	OAIT	SS						<b>√</b>
Review & document standalone legacy systems & disparate technologies	MP/MP	SS						✓
Implement IT management tools & processes, including a CIO balanced scorecard process, change management system, business case process, & a business value assessment tool.	OAIT	SS						<b>√</b>
Evauate, develop, & implement an IT risk management process.	OAIT	SS						✓
Create Executive Information System, an automated group of applications/services for the MSFC executive management team.	OAIT	SS						<b>√</b>
Obtain Project Management Certification for all Agency Project Managers.	MP/MP	SS						✓
Gather information & create the baseline of core competencies & critical skills necessary for the Office	OAIT	SS						✓
Identify organizational training coordinators, develop consolidated organizational training plans & identify specific training budget requirements for FY 2005.	OAIT	SS						✓
Participate in initiatives to leverage IM/IT best practices & lessons learned. Conduct technology forums & sponsor technology trade shows.	OAIT	SS						✓

94 —

### Year 4-5: FY 2009-FY2010

Year 4-5: FY 2009-FY2010								
				e e	lity	ing	ent, w IT t lete.)	O
(10/01/08–09/30/10)			MSFC CIO Objective 1 Provide a robust & interoperable IT infrastructure	MSFC CIO Objective 2 Ensure IT resources & infrastructure are secure & accessible	MSFC CIO Objective 3 Deliver innovative, quality products & services	MSFC CIO Objective 4 Be the leader in delivering Agency IT services	MSFC CIO Objective 5 Balance & optimize IT investments, development, standardization, (Review IT architecture to ensure it does not become obsolete.)	MSFC CIO Objective 6 Lead the technical & business management of IT resources at MSFC
MSFC CIO Initiatives	Category	State	MSF Prov inter infra	MSF Ensu infra	MSF Deliv prod	MSF Be th Agen	MSF Balar inves stand archi does	MSF Lead busir of IT
Development of a Mobile Technology policy.	OAIT	SS	✓					
Provide WebEx service.	OAIT	SS	✓					
Design, develop, & implement a system to provide streaming video content to the user's desktop.	OAIT	SS	✓					
Support development, deployment, & operation of the Integrated Engineering Capability Design & Data Management System.	MP/MP	SS	✓					
Provide HOSC Internet Voice Distribution Systems (IVoIDS) to <i>ISS</i> Payload Operations support personnel.	PS	SS	<b>√</b>					
Implement fast-Gigabit Ethernet HOSC Downlink Enhancement Architecture (IDEA).	PS	SS	✓					
VoIP Pilot.	MP/MP	SS	✓					
Integrated Collaborative Environment (ICE).	MP/MP	SS	✓					
Windchill Implementation Integrated Engineering Capability.	MP/MP	SS	<b>√</b>					
Building 4600 Network Installation.	OAIT	SS	✓					
Upgrade Center document management capabilities.	OAIT	SS	✓					
Expand deployment of Mobile Technology capabilities at MSFC.	OAIT	SS	✓					
Operate & maintain secure voice, data, & video communications services.	OAIT	SS	<b>√</b>					
Support Advanced Engineering Environment (AEE) Infrastucture Team.	MP/MP	SS	<b>√</b>					
Research Data Center Lab, which will provide the capability to perform isolated product & equipment V&V.	MP/MP	SS	<b>√</b>					
Determine needed upgrades for the Marshall Local Area Network (LAN).	OAIT	SS	✓					
Document/define metadata repository model & how existing & new applications & Web services fit.	OAIT	SS	✓					
Explore ultra-computer capabilities for use at MSFC.	OAIT	SS	✓					
Integrate existing knowledge management systems across MSFC; repository of information to be easily accessed & searched by employees.	OAIT	SS	<b>√</b>					
Common Badge Access Control (CBACS) & Smart Card	OAIT	SS		✓				
Implement Fail-over Database Capability for NASA Cyber Attack Response System (NCARS).	OAIT	SS		✓				
IT Security Center Phase II.	OAIT	SS		✓				
Intrusion Detection System Router Upgrade.	OAIT	SS		✓				
Develop, Implement & Monitor the MSFC IT Security Program.	OAIT	SS		✓				
Implement Center IT Security vulnerability identification & mitigation program.	OAIT	SS		✓				
Implement Center IT Security incident response & investigation capability.	OAIT	SS		✓				
Enhance the NASA security posture, via implementing SRR69 Agency perimeter firewall infrastructure, aligning NSSTC network with Agency & Center domain structure, annual review of IT security, service continuity, contingency, & disaster recovery plan.	OAIT	SS		<b>√</b>				
Ensure Center IT System Certification & Accreditation.	OAIT	SS		✓				
Provide required IT Security Training & Certification opportunities.	OAIT	SS		✓				
Provide Plan of Actions & Milestones (POA&M) tracking & reporting of IT Security Weaknesses	OAIT	SS		✓				

Voor / 5. EV 2000 EV2040 /continue	۹/							
Year 4–5: FY 2009–FY2010 (continue (10/01/08–09/30/10)		0	MSFC CIO Objective 1 Provide a robust & interoperable IT infrastructure	MSFC CIO Objective 2 Ensure IT resources & infrastructure are secure & accessible	MSFC CIO Objective 3 Deliver innovative, quality products & services	MSFC CIO Objective 4 Be the leader in delivering Agency IT services	MSFC CIO Objective 5 Balance & optimize IT investments, development, standardization. (Review IT architecture to ensure it does not become obsolete.)	MSFC CIO Objective 6 Lead the technical & business management of IT resources at MSFC
MSFC CIO Initiatives	Category	State	Pre infi	MS Eng infu	MS Del	MS Be Ag	MS Bal Bal inv inv sta sta arc doo	MS Leg
Provide Plan Of Actions & Milestones (POA&M) tracking & reporting of IT Security Weaknesses.	OAIT	SS		✓				
Define a common process for applications security for application/web access depending on security level.	OAIT	SS		✓				
Provide NACC rate options for variable billing to Centers.	OAIT	SS			✓			
Support the Global Hydrology Research Center (GHRC), which provides both historical & current Earth science data, information, & products from satellite, airborne, & surface-based instruments.	MP/MP	SS			<b>√</b>			
Provide hardware & software maintenance & IT support personnel for Earth Planetary Science data servers, satellite data processing, & archives.	MP/MP	SS			<b>√</b>			
Office of Biological & Physical Research Image Gallery Web Site.	PS	SS			✓			
Maintain Payloads 1 Web server, that provides <i>ISS</i> information such as payload integration & operations data.	PS	SS			✓			
Maintain the Payload Data Library (PDL), which allows users access to data associated with their assigned payloads, as approved by NASA authorized personnel.	MP/MP	SS			✓			
Maintain the Telescience Support Center (TSC), which provides user connectivity to the Payload Operations & Integration Center (POIC) Data, Voice, & Video Systems.	MP/MP	SS			<b>√</b>			
Provide customer support for X-ray Calibration Facility (XRCF), including system administration, system loading & updating, & IT security.	PS	SS			<b>√</b>			
Advanced Microwave Scanning Radiometer (AMSR-E) & Earth Science Information Partner (SIPS) Data Processing.	PS	SS			<b>√</b>			
Maintain FD42 Mission Planning development systems	MP/MP	SS			✓			
Provide National Space Sciences & Technology Center (NSSTC) with IT infrastructure & customer support.	OAIT	SS			✓			
Provide Windows-based testing & archiving systems for the Environmental Control & Life Support System (ECLSS) Development subsystems in support ISS.	PS	SS			<b>√</b>			
Provide hosting to the Ground Systems Department Web Site, home of the Telescience Resource Kit (TReK) that ISS payloads scientists can use to control their payloads remotely.	PS	SS			<b>√</b>			
Support Huntsville Operations Support Center (HOSC) Payload Operations Integration Center (POIC) systems.	MP/MP	SS			✓			
Develop the Lightning Mapping Array (LMA), which will consist of 12 measurement stations deployed over northern Alabama. Information is relayed to the NSSTC through a microwave communications link.	PS	SS			<b>√</b>			
Perform software development, digital signal processing, & monitoring of audio labs systems.	MP/MP	SS			✓			
Manage Lightning Imaging Sensor data, including two types of science, housekeeping, & ephemeris data daily. The data are used worldwide by the lightning scientific community.	MP/MP	SS			<b>√</b>			
Support Integrated Engineering System (IES), the primary CAD/CAM/CAE system at MSFC.	PS	SS			✓			
Maintain Optical Plume Anomaly Detection Lab (OPAD) system used to analyze plumes that occur during mission specific occurrence.	PS	SS			<b>√</b>			
Operate Space Shuttle Main Engine (SSME) Hardware Simulation Laboratory, which supports flight hardware & software verification in support of the SSME.	PS	SS			<b>√</b>			

#### Year 4-5: FY 2009-FY2010 (continued) does not become obsolete. investments, development, standardization. (Review IT Be the leader in delivering Deliver innovative, quality products & services Lead the technical & business management of IT resources at MSFC nfrastructure are secure architecture to ensure it (10/01/08-09/30/10)MSFC CIO Objective 5 MSFC CIO Objective 6 MSFC CIO Objective 2 MSFC CIO Objective 3 MSFC CIO Objective 4 Ensure IT resources & MSFC CIO Objective 1 Balance & optimize IT Provide a robust & interoperable IT Agency IT services nfrastructure & accessible State **MSFC CIO Initiatives** Category PS Operate Controller Software Lab (CSL), the mirrored SS Site of the HSL. The lab is located in Research Park at the Boeing facility. Support Flight Software Development system used to MP/MP SS develop embedded flight software for various programs. Support Antenna Range Data Collection & Analysis PS SS System (ARDCAS) Support Radio Frequency Lab system used to develop SS PS radio frequency simulations & analyze the results. Maintain the Contact Dynamic Simulation Lab & the PS SS Flight Robotics Lab (FRL). Maintain the Avionics System Testbed (MAST). PS SS Support Ascent Imagery analysis of Shuttle elements. PS SS Support Collaborative engineering design, analysis & PS SS visualization. Support the Virtual Research Center (VRC), a Web-MP/MP SS ✓ based project management system that provides a central location for making project data available to geographically dispersed teams. Maintain the Materials & Processes Technical MP/MP SS Information System (MAPTIS), which serves all NASA Enterprises by capitalizing on information technologies to satisfy unique customer requirements. Maintain High-resolution Digital Radiography (HRDR) PS SS system, which is connected to the NASA private network to FTP digital x-ray images from UNIX systems. Support the Flash Computed Tomography (FlashCT) PS SS system, used to CT composites, ceramics, small metallic castings & components. Support Collaborative Engineering Center, a facility for PS SS advanced visualization & multidiscipline engineering Manage Ground Systems Department Web-deployed SS PS databases, where customer survey data is collected for HOSC Participate in Incident Reporting Information System PS SS (IRIS) User Group, & perform MSFC administrative functions & interfaces as necessary Support Science Directorate Internal Web site to provide MP/MP SS NASA employees with current information on the Science Directorate. Maintain Science Directorate Science Communication MP/MP SS Web site to help the public understand how exciting NASA research is & help NASA scientists fulfill their outreach responsibilities. Maintain the Science Directorate Publications Metrics MP/MP SS Database (SDMD), used to enter & retrieve information regarding the professional & community activities of NASA & contract scientists. Maintain NSSTC Personnel List Web Application, which OAIT SS ✓ allows the searching of the NSSTC personnel list by several options Maintain NSSTC public Web site, which provides the PS SS public with current information about the NSSTC. including news releases & a calendar of events. Maintain Microgravity Web site, which provides current PS SS information on the Microgravity Research Program Office, as well as providing a site about microgravity

designed for children.

Year 4-5: FY 2009-FY2010 (continue	d)					ĵ	nt, IT ie.)	
(10/01/08–09/30/10)			MSFC CIO Objective 1 Provide a robust & interoperable IT infrastructure	MSFC CIO Objective 2 Ensure IT resources & infrastructure are secure & accessible	MSFC CIO Objective 3 Deliver innovative, quality products & services	MSFC CIO Objective 4 Be the leader in delivering Agency IT services	MSFC CIO Objective 5 Balance & optimize IT investments, development, standardization. (Review IT architecture to ensure it does not become obsolete.)	MSFC CIO Objective 6 Lead the technical & business management of IT resources at MSFC
MSFC CIO Initiatives	Category	State	MSF Prov inter	MSF Ensi infra & ac	MSF Deliv proc	MSF Be tl Age	MSF Bala inve stan arch does	MSF Lead busi of IT
Support the Space Product Development Web site, which provides information regarding opportunities & contact names for the commercialization of space product development.	PS	SS			<b>✓</b>			
Maintain Glovebox Integrated Microgravity Isolation Technology (G-LIMIT) Web site, which provides current information on the G-LIMIT system, its development & its use.	PS	SS			✓			
Maintain Biological Crystal Growth Web site, which provides the public with current information on past, present, & future NASA crystal growth experiments.	PS	SS			✓			
Maintain Microgravity Development Laboratory Web site, used for information dissemination to lab personnel only.	PS	SS			<b>√</b>			
Maintain Student Access to Space Web site, which provides information on Program, as well as resources for students & teachers.	PS	SS			<b>√</b>			
Provide software support for the Low-energy Neutral Atoms (LENA) instrument on the Imager for Magneto- pause-to-Aurora Global Exploration (IMAGE).	PS	SS			✓			
Provide software support for three instruments on the Polar Spacecraft, Thermal Ion Dynamics Experiment (TIDE), Ultraviolet Imager (UVI), & Plasma Source Instrument (PSI).	PS	SS			✓			
Provide Solar Physics Support Software (SPSS) for the Vector Magnetogram Analysis Package (VMAP) & Quick VMAP (QVMAP).	PS	SS			✓			
Maintain Earth Science Web site, which provides information about Global Hydrology & Climate Center (GHCC) research.	PS	SS			<b>√</b>			
Support Brazil Lightning Detection Network (BLDN). The current BLDN status & lightning activity are made available on the Web in near real-time to scientists, locally & in Brasilia.	PS	SS			<b>√</b>			
Maintain Space Optics Manufacturing Technology Web site.	PS	SS			✓			
Participate in periodic telecons & face-to-face meetings with Advanced Technology Center & champion 1-NASA S&MA tools.	PS	SS			<b>√</b>			
Develop & support software to decode & graph data from the IMAGE project.	PS	SS			✓			
Support Solar Ultraviolet Magnetograph Instrument Program	PS	SS			<b>√</b>			
Support software development for the Gamma-Ray Large Area Space Telescope (GLAST).	PS	SS			<b>√</b>			
Provide customer applications & services on midrange computing systems. Specific customers include Code T, TD64, WebTADS, SOLAR, NAIS,NOSC, NEMS, & general.	OAIT	SS			<b>✓</b>			
MSFC midrange systems.	OAIT	SS			✓			
Evaluate, design, & develop midrange systems based on customer business needs & requirements. Activity occurs as necessary.	OAIT	SS			<b>✓</b>			
Provide a comprehensive range of IT Services that are competitively priced in a secure, reliable $7\times24$ World Class Data Center.	OAIT	SS			✓			
Provide high-quality Agencywide IT support. Support NASA budget system, participate in face-to-face meetings for various Agencywide products, & conduct HQ & center customer visits.	OAIT	SS			✓			

# Year 4-5: FY 2009-FY2010 (continued)

(10/01/08-09/30/10)

(10/01/08–09/30/10)			MSFC CIO Objective 1 Provide a robust & interoperable IT infrastructure	MSFC CIO Objective 2 Ensure IT resources & infrastructure are secure & accessible	MSFC CIO Objective 3 Deliver innovative, qualit products & services	<b>MSFC CIO Objective 4</b> Be the leader in deliverin Agency IT services	MSFC CIO Objective 5 Balance & optimize IT investments, developme standardization. (Review architecture to ensure it does not become obsole	MSFC CIO Objective 6 Lead the technical & business management of IT resources at MSFC
MSFC CIO Initiatives	Category	State	MSF Prov inter infra	MSF Ensu infra & ac	MSF Delip prod	MSF Be t Age	MSF Bala inve stan arch does	MSF Lead busi of IT
Provide timely IT assessments & visibility into IT activities via roundtable discussions, management status reports, & all-hands briefings.	OAIT	SS			<b>→</b>			
Improved availability of cellular services at MSFC.	OAIT	SS			✓			
Improve STS launch imagery, establish HDTV downlink station development test objective & imaging sensor, & create ISS downlink enhancement architecture.	PS	SS			<b>√</b>			
Improve shuttle ascent & landing ground camera systems, accomplish HDTV downlink Station Development Test Objective.	PS	SS			✓			
Support Telescience Resource Kit (TReK) systems, used for the development of TReK software deployed to <i>ISS</i> Payload teams around the world via the TReK Web site.	PS	SS			✓			
Maintain Shuttle Engineering Support Center (PCGoal) systems, used to analyze & diagnose Space Shuttle Element anomalies in the prelaunch time frame.	PS	SS			<b>~</b>			
Support Meteorological Interactive Data Display System (MIDDS), which will process meteorological weather data in support of Shuttle prelaunch preparation & launch activities.	PS	SS			<b>→</b>			
Support Flight Projects Directorate Information System, a read-only information system that serves as a management tool to track Civil Service Workforce utilization on the projects managed by Flight Projects.	PS	SS			<b>~</b>			
Development IT Portfolio Management Tool.	OAIT	SS			✓			
Evaluate the unified messaging initiative, XML working group, future wireless technologies, & others for use in the Office of the CIO scope.	OAIT	SS			<b>√</b>			
Workforce Integrated Management System (WIMS).	OAIT	SS				✓		
Maintain Recruitment One-Stop to deliver online recruitment services.	OAIT	SS				✓		
HQ E-Mail Initiative (HEMI).	OAIT	SS				✓		
Upgrade NISN WAN backbone infrastructure.	OAIT	SS				<b>√</b>		
Consolidate Agency IT Infrastructure under the NASA Data Center (NDC).	OAIT	SS				<b>√</b>		
Lead transition of Agency's television production infra- structure to digital television (DTV).	OAIT	SS				<b>√</b>		
Institute NASA-wide physical access control system via SmartCard technology.	OAIT	SS				<b>√</b>		
Provide high quality products & services to NISN customers, conduct NISN customer forums, conduct NISN site visits.	MP/MP	SS				<b>√</b>		
Upgrade services for Russian Operations support, including PGP licenses, Web site for HSFP-R & NISN/RSVG requirements, PC Waterfall, video streaming, & office set-up.	PS	SS				<b>√</b>		
Implement Agency-wide transition to DTV.	OAIT	SS				✓		
Provide comprehensive range of NASA Data Center IT services at competitive prices.	OAIT	SS				<b>√</b>		
Provide Agencywide services and support to all customers and potential customers.	OAIT	SS				✓		
Implement NASA Integrated Services Environment (NISE) initiatives NASA-wide account management (NAMS), directory services (CIMS), and identity management (IDMS).	OAIT	SS				<b>√</b>		
Support the NSSC implementation.	OAIT	SS				✓		
	MOFO		-			<b>T</b> .	nology Plan —	0

Year 4-5: FY 2009-FY2010 (continued)						lt, ∏ e.)		
(10/01/08–09/30/10)		MSFC CIO Objective 1 Provide a robust & interoperable IT infrastructure	MSFC CIO Objective 2 Ensure IT resources & infrastructure are secure & accessible	MSFC CIO Objective 3 Deliver innovative, quality products & services	MSFC CIO Objective 4 Be the leader in delivering Agency IT services	MSFC CIO Objective 5 Balance & optimize IT investments, development, standardization. (Review IT architecture to ensure it does not become obsolete.)	MSFC CIO Objective 6 Lead the technical & business management of IT resources at MSFC	
MSFC CIO Initiatives	Category	State	MSF Prov inter infra	MSF Ensi infra & ac	MSF Delir proc	MSF Be t Age	MSF Bala inve stan arch does	MSF Lead busi of I7
Design, develop & implement the "As Is" Enterprise Architecture for MSFC, including definition of tools for analysis.	OAIT	SS					✓	
Build MSFC Enterprise Architecture to conform to OMB, GAO, NASA, & FEA standards.	OAIT	SS					✓	
Create CRM plans, programs, & interfaces to keep the customers informed of IT initiatives.	OAIT	SS					<b>√</b>	
Develop & implement plan to improve customer satisfaction of products & services, update catalog, & develop benchmarks & cost comparisons for customers.	OAIT	SS					<b>√</b>	
Implement a customer experience management evaluation process by conducting customer research.	OAIT	SS					✓	
Design, develop, & implement first cut of the "To Be" Enterprise Architecture for MSFC including definition of tools for analysis.	OAIT	SS					✓	
Establish & maintain an integrated IT Planning framework process that ensures alignment of business & IT goals.	OAIT	SS					<b>√</b>	
Implement IT management tools & processes, including a CIO balanced scorecard process, change management system, business case process, & a business value assessment tool.	OAIT	SS					<b>√</b>	
Establish a process to ensure new projects conform to the "To Be" Enterprise Architecture as much as it is defined at that juncture.	OAIT	SS					✓	
Provide a Web-enabled process to update, analyze, & support the management of critical assets & capabilities at MSFC.	OAIT	SS						<b>√</b>
Develop best practices & processes for Software Engineering Process Group (SEPG) development & maintenance.	OAIT	SS						<b>√</b>
MAF Product Manager Migration	PS	SS						✓
Provide IT Project expertise to MSFC & NASA. Establish rapport with MSFC & NASA to offer IT expertise & project management for MSFC or Agencywide IT initiatives.	MP/MP	SS						<b>√</b>
Provide interface to support all initiatives of the NASA CIO. Submit annual IT & Center POP to NASA CIO, Evaluate & provide input to proposed policies, provide all required reports.	OAIT	SS						<b>√</b>
Review & document standalone legacy systems & disparate technologies	MP/MP	SS						✓
Evauate, develop, & implement an IT risk management process.	OAIT	SS						✓
Create Executive Information System, an automated group of applications/services for the MSFC executive management team.	OAIT	SS						<b>√</b>
Obtain Project Management Certification for all Agency Project Managers.	MP/MP	SS						✓
Gather information & create the baseline of core competencies & critical skills necessary for the Office	OAIT	SS						✓
Participate in initiatives to leverage IM/IT best practices & lessons learned. Conduct technology forums & sponsor technology trade shows.	OAIT	SS						✓

www.nasa.gov

National Aeronautics and Space Admininstration

George C. Marshall Space Flight Center Huntsville, Alabama 35812